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The

Indian Medical Gazette

TRAGEDY NUMBER

A TRAGEDY the like of which had not shocked the world for 1,915 years enveloped India in gloom on the 30th January, 1948! Medical men are affected like other men. Medical India mourns.

The Indian Medical Gazette is bringing out a special number in two months' time. Contributions are invited on all subjects which mitigate suffering and thus would have found favour with the Mahatma.

The following subjects are suggested:

- 1. Psychology of lesser men, men and supermen.
- Social fabric, population pressure, poverty and misery.
- Crime and punishment. The irresistible impulse.
- Juvenile and senile delinquencies.
- Capital punishment.
- Hanging as capital punishment.
- Shooting as capital punishment.

 Preservation of human dignity and liquidation of unwanted life.
- 10. Euthanasia.
- Operation for abortion.
- Killing and callousness.
- 13. Humane slaughter.

- Food, gluttony and fasting.

 Stimulating drugs, their use and abuse.

 Beverages, intemperance and prohibition.

 The present system of education in general and medical education in particular.
- 18. Span of human life.

Contributions are not limited to medical men only: Veterinary surgeons, missionaries, lawyers, educationists and social workers are also contributing.

Original Articles

INCIDENCE OF PRIMARY CARCINOMA OF THE LIVER AND OTHER ORGANS AS INFERRED FROM AUTOPSY WORK, 1926 TO 1946

By P. V. GHARPURE, M.D.

(From the Pathology School, Grant Medical College, Bombay)

In a short paper (Gharpure, 1927) the writer set forth autopsy data relating to the incidence of primary carcinoma in India as inferred from post-mortem records of fifty years, 1877 to 1926. In that paper he referred to work done in his institute only.

It appears that the data from that paper have been used by Berman (1940) and subsequently by other authors. The annual report of the British Empire Cancer Campaign for the year 1946 at page 30 contains the following state-

ment:-

'The data collected by Berman indicate that primary cancer of the liver is prevalent in varying degrees over the southern half of Africa, India, the East Indies, China and Japan. Thus the published material, admittedly very inadequate, yields the following figures for primary carcinoma of the liver as a percentage of carcinoma of all organs:—

Bantu, South	Africa			37.0
Javanese				36.0
Chinese				36.0 ·
Indians			• •	28.0
Philippines	• •	• •	• •	22.0
Semi-Bantu	••	• •	• •	18.7
Japanese				7.8

It will be observed that the incidence of primary carcinoma of the liver is alleged to be 28 per cent of all malignant growths.

Berman's paper contains the following state-

ments:-

'The liver in the pigmented races of mankind on the other hand is exception to Virchow's rule since primary cancer of the liver is very common amongst the Bantu. Virchow's dictum is still true of the European liver that those organs which are most frequently the site of metastasis are only in the rare instances themselves the seat of primary growth'.
 'The object of this paper is to establish as

far as the material allows the distribution of the primary carcinoma of the liver amongst the Bantu as a whole and to compare the frequency locally with that found in the different races of

mankind'.

Berman in his paper gives some figures for British Indians. Presumably he has combined the figures given by the present writer (1927) and that of Vishwa Nath and Grewal (1935), and has worked out 0.32 per cent primary liver carcinoma incidence of total autopsies. In table 8 of his paper, Berman gives the total of tumour

cases from the same combined source as 81 and of this, he states, 23 are primary carcinoma of liver.

These statements have created confusion as can be easily seen from the extract from the British Empire Cancer Campaign annual report

for 1946 reproduced above.

The writer is not in possession of studied data of other Asiatic countries. So far as facts known to him and so far as they lead to inferring the incidence of primary carcinoma to the liver in autopsy material in Bombay, this primary new growth is rare. Certainly it is not 28 per cent of all malignant tumours.

In para 4 on page 67 of his paper, Berman

also states :-

'The Japanese figure 0.2 equalled that for the Bantu, while amongst the Chinese it was 0.9 per cent. The Philippine Islands followed with 0.44 per cent. The Indian with an incidence of 0.32 per cent apparently was the least affected '.

It will be seen that the statements by Berman leave the reader in a confused state as regards the incidence of primary carcinoma of liver in India.

In this note further evidence is produced in support of what the writer wrote in the first note (1927), viz 'The rarity of this affection carcinoma in the four organs, liver, pancreas, gallbladder and stomach—may well be judged by the fact that only 36 cases have been recorded in the collection of 6,000 and odd autopsies, during the last fifty years (1877 to 1926).

As seen from the appendices to the paper,

36 cases were considered:—

Liver	• •		 14
Stomach			 13
Pancreas	• •		 7
Gall-bladder	• •	• •	 2
		Тотль	 36

In appendix A there is an account of 14 cases of carcinomatous liver with case histories. In this group-'On careful study of the notes and microscopic sections, I feel that in only two cases is the conclusion (primary carcinoma liver) beyond doubt' and in all others there is no convincing evidence to declare the liver to be the

site of primary carcinoma.

On restudying the post-mortem record of that period (1877 to 1926) a total of 21 cases can be picked out in which the liver has been carcinomatous and the question of primary carcinoma arises. Of this total of 21, 7 may be omitted as being totally unsatisfactory—2 partial post mortems, 1 no notes but only heading given, and 4 inadequate description. Of the remaining 14, in 9 there has been presumptive evidence to call the liver primary carcinoma, and in 5 the conclusion is doubtful.

The writer therefore accepts responsibility suggesting that there were 9 primary carcinoma of liver in a total of 6,000 and odd

autopsies.

With reference to the next period of twenty years 1926 to 1946 the conditions governing the availability of the post mortems in Bombay have remained more or less the same as in the previous 50 years period. The writer has been intimately in contact with all post-mortem work during this period except from June 1941 to November 1945, when he was serving in the Army. During this period there occur 8 proven cases of primary carcinoma of liver in 4,000 and odd autopsies. The incidence of diseases as judged from autopsy records is better judged if data relating to total autopsies, deaths and admissions are made available.

The following details relate to the period 1926 to 1946:—

Period from 1st Janu to 31st December, 1		1926		
Total admissions	13	54,742	Males	129,314
			Females	25,428
Total deaths		13,497		
Sex incidence available	e in	7,593	Males	5,962
		•	Females	1,901
Total autopsies		4,321	Males	3.546
		•	Females	775
Total tumours		131	Males	110
	• •		Females	21
Primary liver		8	Males	7
,	••	•	Female	i
Secondary liver		18		•
COOCHAGE ATTOX	• •			

The background of these data is valuable and the reader can draw his conclusions in a proper perspective. Similar has been the background of all former papers (Gharpure, 1927; Gharpure, 1928; Tilak, 1938; and Bhajekar, 1942) published from this institution relating to the incidence of diseases.

In the material now reported there occur 131 primary malignant tumours. Their distribution is detailed in the table below:—

The conclusion that the primary carcinoma of the liver is rare is confirmed. These conclusions are fairly parallel with those made by Khanolkar (1945).

Summary

1. Statements by Berman are discussed.

2. A paper published in 1927 is re-examined. Nine cases of probable primary carcinoma of liver in 6,000 and odd autopsies are reconsidered.

3. Fresh data from 4,000 and odd autopsies are presented in which 8 cases of primary carcinoma of the liver occur in a total of 131 primary malignant tumours of all organs.

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PELVIC FLOOR REPAIR UNDER PERINEO-PUDENDAL BLOCK ANÆSTHESIA

By MARY P. JOHN, M.B., B.S., M.R.C.S., M.R.C.O.G.

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In gynæcological surgery general anæsthesia still enjoys universal popularity, a century after the introduction of inhalation anæsthesia. It is, however, felt that there are certain cases in which some other and safer method of anæsthesia would be desirable. In old patients

TABLE

			TABL	E)				
Tumour	Total	Males	Females	Hindu	Muslim	Christian	Chinese	Unknown
Abdominal Brain Breast Chest Duodenum Face, cheek Femur Gall-bladder Intestine Kidney Larynx Œsophagus Ovary Pancreas Parotid Penis Prostate Rectum Skin Stomach Suprarenal Testis Thyroid Tongue Tonsil Urinary bladder Uterus Liver	5 2 nil 22 3 6 1 2 6 5 16 7 3 3 3 5 5 4 2 1 8 1 3 2 6 1 6 8	5 2 .:1 3 5 1 1 6 3 5 4 2 1 8 1 3 .:61 .:.7	.; .; .; .; .; .; .; .; .; .; .; .; .; .	4 1 14 14 11 12 3 13 5 2 2 4 4 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2		1 3 2 1 1 1	i	1 Jew 2

and in those having associated complications like cardiovascular degeneration, renal disease, diabetes, bronchitis, hypertension, etc., general anæsthesia, particularly ether, is not suitable, although these complications by themselves are not sufficient to contra-indicate surgery.

A considerable proportion of gynacological operations consist in plastic repair of the pelvic floor. The patients suffering from genital prolapse are mostly elderly and the use of ether alone or in combination with other anæsthetics makes them more prone to post-operative com-

It was, therefore, decided to give a trial to perineo-pudendal block anæsthesia in selected cases who were judged not to be good subjects for general anæsthesia. The result of this anæsthesia was found so satisfactory that this method is now being used as a routine in all cases of pelvic floor repair by the author. The usual objections to local anæsthesia are increased time of operation and unsuitability in highly strung patients; these do not apply here as only about seven minutes are required to induce block anæsthesia and the patient usually sleeps throughout the operation. In this series no case was abandoned nor required any supplementary anæsthetic.

The following technique is used. Premediention is induced by morphine sulphate gr. 4 and hyoscine hydrobromide gr. 1/150 (given subcutaneously 45 minutes before operation). Strict silence is enjoined and the patient instructed to sleep. When she is asleep the table is wheeled into the theatre and the operation commenced. The solution for block

CHART

Number	Age	Type of prolapse	Nature of operation	Result of	Recovery	REMARKS
		prompse	Operation			
1	50	Complete prolapse.	Manchester operation	Very satisfactory	Uneventful	Emphysema of lungs.
2*	30	Do.	Do.	Satisfactory	Secondary hemor- rhage on 9th day;	BP 110/70. BP 100/70. Hb. 55 per cent.
3	60	Do.	Do.	Very satisfactory	recovered. Uneventful	Large goitre
4	38	2nd degree prolapse. Cystocele. Hernia of pouch of Douglas.	Ant. colporrhaphy. Amputation of cervix. Repair of pouch of Douglas herma. Post- colpoperineorrhaphy.	Do.	Inflammatory effusion left side, subsided rapidly with sulphon- amides.	BP 195/95. General condition before operation good.
5	40	2nd degree prolapse. Marked	Ant. colporrhaphy. Post-colpoperineor- rhaphy.	Do.	Uneventful	General health good.
6*	22	cystocele. Marked cystocele. Cyst of post-vaginal wall.	Ant. colporrhaphy. Enucleation of vaginal cyst. Post-colpoperi- neorrhaphy.	Satisfactory	Do.	Do.
7	50	Complete prolapse.	Manchester operation	Very satisfactory	Do.	Do.
8	34	2nd degree prolapse.	Do.	Do.	Do.	Do.
9	40	Complete prolapse.	Do.	Do.	Do.	Do.
10† 11	48 45	Do. Cystocele. 1st degree	Do. Ant. colporrhaphy. Post-colpoperi-	Satisfactory Very satisfactory	Do. Do.	Do. Do.
12†	20	prolapse. Marked cystocele. 2nd degree perineal	neorrhaphy. Do.	Satisfactory		
13	22	tear. Ist degree prolapse. Marked cystocele.	D_0 .	Very satisfactory	Uneventful	General health
14	22	Do.	D_0 .	Do.	Do.	DD do. m.
15*	26	Vesico- vaginal fistula.	Repaired	Satisfactory	Wound broke	BP 104/75. Hb. 50 per cent. General health
16	21	Do.	Do.	Very satisfactory	Cured	good. Do.
* Comr	o barier	f hackacha tor	1 11		i I	

Complained of backache towards the end of operation.

[†] Was not asleep at the beginning of the operation and hyoscine hydrobromide gr. 1/200 was repeated.

anæsthesia consists of 1 per cent novocaine with addition of 4 minims of adrenaline hydrochloride to an ounce. An intradermal wheal is raised on one side midway between the ischial tuberosity and the anus with a fine needle. A 10 cm. long needle is then passed through this and with the help of the left index finger in the vagina the needle is guided to the dorsal surface of the ischial spine where 15 c.c. of the solution is injected blocking the pudenal nerve as it courses over the ischial spine (see figure, plate I). Before injection the piston is withdrawn slightly to ensure that the needle is not in a blood vessel. The needle is then withdrawn until the point is in the subcutaneous tissue and is directed towards the ischial tuberosity. With the needle in constant motion about 12 c.c. of the solution is injected on the inner side of the tuberosity in a fan-shaped manner blocking the branches of the posterior femoral cutaneous nerve. The needle is then directed towards the midline of perineum and 10 c.c. of the solution injected blocking the muscular branches of the sacrai plexus, then forward on the vulva as far as the level of the clitoris and more of the solution is injected while slowly withdrawing the needle blocking the branches of the ilio-inguinal nerve.

The results of the anæsthesia and the operations are appended in the table which includes repair of two cases of vesico-vaginal fistulæ

under this method of anæsthesia.

Plastic operations for uterine prolapse have been performed under local anæsthesia with satisfactory results (Peham and Amreich, 1934; Griffin and Benson, 1941) though it appears that this method has not been given extended trial except in certain clinics. The advantages of local anæsthesia are too well known to need elaboration here. The particular advantages of this method in prolapse operations are absence of post-operative sickness, reduction of postoperative pulmonary complications, reduction of bleeding in the field of operation, and that the services of an anæsthetist are not required. Its another great advantage in the tropics is that fluids can be administered to the patient before, during and immediately after the operation: an important point in avoiding water and salt depletion during summer.

Summary

General anæsthesia is still widely used in gynæcological surgery. Genital prolapse usually occurs in the elderly and some of these patients are not suitable subjects for inhalation or spinal anæsthesia due to associated complications. Perineo-pudendal block anæsthesia with novocaine is a safe and satisfactory anæsthesia for routine use and has several advantages over inhalation anæsthesia.

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OBSERVATIONS ON PNEUMOCOCCAL MENINGITIS AS A COMPLICATION OF KALA-AZAR

By P. C. SEN GUPTA, M.B. K. N. BASU MALLIK, M.B.

and

N. K. CHAKRAVARTY, M.B.

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KALA-AZAR is a disease that is not infrequently associated with many serious complications, the well-known examples of which are cancrum pneumonia dysentery, and pneumonia, hæmorrhages, anæmia, generalized ædema, etc. Agranulocytosis is another relatively uncommon but grave complication. During the recent outbreak of kala-azar in Calcutta that commenced after the Bengal famine of 1943. increasing numbers of seriously complicated cases of kala-azar were seen (Sen Gupta, 1947) and one of the grave complications was pneumococcal meningitis. During the last two years, 1945 and 1946, four cases of kala-azar who had developed this complication were admitted under the care of the senior writer into the Carmichael Hospital for Tropical Diseases. (During this period 314 cases of kala-azar were admitted into the hospital.) Except for the mention of finding two cases of pneumococcal meningitis in the post-mortem examination of 40 cases of kala-azar by Rogers (1919), there is apparently no recent record of this complication in kala-azar in the available medical literature. The notes of these four cases, along with the post-mortem findings of one of the cases, are presented below and the findings discussed.

Case notes

Case 1.—A Nepali male, aged 14 years, was admitted on the 22nd September, 1945, for fever with splenic enlargement, duration uncertain; attacks of diarrhea with occasional passage of blood and mucus for about five years; swelling of the legs and the abdomen for about four months; along with cough, malnutrition and anæmia. In 1944 he had been admitted into another hospital as a famine-stricken 'destitute'.

On admission the patient was found to be very weak, anemic and emaciated. There was cedema of the legs up to the knees and ascites. Angular stomatitis was present. The lungs showed diminished breath sounds, vocal resonance and fremitus over both bases. The heart showed no abnormality except simple tachycardia. The liver was enlarged up to 1 inch below the costal margin and the spleen

to the umbilicus.

Laboratory reports

Urine.—Albumin present, casts or RBC not present.

Fæces.—Ova of ascaris present, 1,000 per c.em. of fæces.

9

Blood count.—Hæmoglobin, 34 per cent = 4.67 gm. per 100 c.c.; RBC, 2.19 million per c.mm.; WBC, 2,000 per c.mm.; complement-fixation test for kala-azar, positive; sternal

puncture, L.D. bodies present.

With hospitalization, restriction of diet and symptomatic treatment for diarrhea, edema, cough and avitaminosis, the patient made considerable progress and lost 3 lb. by loss of ædema. After the sternal puncture was done on the 29th September, 1945, and leishmania found, the patient was put on specific treatment for kala-azar with intravenous injections of aminostiburea on consecutive days. The low fever subsided after five injections. But on the evening of the 7th October, 1945, the patient suddenly developed high fever and became On examination next morning unconscious. signs of meningitis were elicited and a lumbar puncture was done. The cerebrospinal fluid was under slight pressure and about 20 c.c. of slightly turbid fluid were removed.

The patient was given sodium sulphapyridine 2 gm. intramuscularly at once and 1 gm. every 6 hours, and penicillin intramuscularly, in addition to general supportive treatment. improvement was noted and the patient died on

8th October, 1945, in the evening.

Examination of the film from the centrifuged deposit from the C.S. fluid showed gram-positive

lanceolate diplococci.

Case 2.-An Indian female, aged 15 years, was admitted on the 21st March, 1946, for fever, intermittent in type, duration 1½ months, anæmia and bleeding from the gums. She also complained of ulceration inside the mouth that had commenced 3 or 4 days previously, diarrhæa. She had suffered from dysentery in

the past.

On admission the patient was found to be very anæmic and emaciated. She had ædema of the legs and there was a slight tinge of jaundice. The tongue was sore and there was cancrum oris affecting the anterior pillar of the fauces and extending over the soft palate on the right side. The ulcer was foul-smelling and covered with greyish slough. There were numerous petechiæ over the chest, the arms and the hands. Pulse/respiration = 130/36. Temperature 102° F. The heart did not show any abnormality. The lungs showed signs of bronchitis. The liver was enlarged up to 12 inches below the costal margin and the spleen up to 2 inches below the tip of the 9th left costal cartilage.

Laboratory reports

Blood count.—Hæmoglobin, 45 per cent = 6.18 gm. per cent.; RBC, 2.12 million per c.mm.; WBC, 1,600 per c.mm., neutrophil 69 per cent, lymphocyte 29 per cent, monocyte 1 per cent, myelocyte 1 per cent; platelet count 74,000 per c.mm.; prothrombin time 34.5 seconds. The aldehyde and the antimony tests were positive and the complement-fixation test for kala-azar was strongly positive. The van den

Bergh test: delayed positive direct reaction, bilirubin content 1.5 mg. per cent.

The patient was obviously suffering from kalaazar and a sternal puncture was not done. She was treated with penicillin intramuscularly and locally for the cancrum, vitamins C and K and calcium gluconate for the hamorrhages, sulphaguanidine for diarrhoa besides general supportive measures, from 22nd March, 1946 to 25th March, 1946. On the 23rd March, 1946, the slough separated off from the greater part of the ulcer and the cancrum was distinctly cleaner. The diarrheen was controlled by the 25th March, 1946, but the fever persisted and slight hæmorrhage from the cancrum noted on the 24th March, 1946. The specific treatment for kalaazar was commenced on the 25th March, 1946, and only one injection of stibatin given on that day. During the same night the patient had high temperature and convulsions and became unconscious. The next morning the patient was still unconscious and stiffness of the neek and Kernig's sign were present. Lumbar puncture was done; there was almost no increase of pressure and about 10 c.cm. of slightly hazy fluid were drawn. Penicillin 10,000 units in normal saline was administered intrathecally and intramuscular injections of penicillin continued, along with other general treatment. patient did not regain consciousness though no fits occurred after the lumbar puncture. died during the night of the 26th March, 1946.

Examination of the film from the centrifuged deposit from the C.S. fluid showed gram-positive flame-shaped diplococci (pneumococci). blood count on the 26th March, 1946, showed WBC 8,800 per c.mm.—neutrophil 56 per cent, lymphocyte 30 per cent, monocyte 12 per cent and plasma cell and Türk cell 2 per cent.

Case 3.—An Indian male, aged about 30 years, was left in an unconscious state at the kala-azar out-patients' department of the school on the 2nd August, 1946. It was gathered that the patient was a case of kala-azar and that he had received some injections too. Further details about the patient could not be ascertained. patient was immediately admitted into the

hospital.

The patient was very emaciated anæmic and deeply unconscious and apparently desperately ill. The pulse was soft and the respiration was laboured. There was a marked stiffness of the neck and the head was retracted and deviated to the left side. The pupils were somewhat constricted but were equal in size and reacted sluggishly to light. Kernig's sign was present and the plantar reflex showed flexor response; knee jerks were absent. Pulse/respiration = 108/32. The heart sounds were weak and partly masked by adventitious sounds in the lungs. The lungs: right side showed distant tubular breath sounds over the base and impaired percussion notes, the left also showed impaired percussion notes and marked tubular breath sounds over the lower lobe. Also bubbling râles were audible over both lungs. The liver was enlarged up to 1 inch below the costal margin and the spleen was palpable.

A lumbar puncture was done; the fluid was not under pressure and about 10 c.c. were removed. It was watery but slightly turbid. On keeping a fine fibrin clot formed in the cerebrospinal fluid.

Laboratory reports

Blood count.—WBC 24,000 per c.mm.; neutrophil 91 per cent, lymphocyte 6 per cent, monocyte 1 per cent, myelocyte 1 per cent and plasma cell 1 per cent.

Sternal puncture showed Leishmania donovani. Cerebrospinal fluid showed 750 cells per c.mm. and smear showed neutrophils and gram-positive cocci in pairs (pneumococci) and culture showed pneumococci.

The patient was treated with penicillin intrathecally and intramuscularly, sodium sulphapyridine intramuscularly besides general supportive treatment with glucose intravenously and oxygen inhalations and circulatory stimulants. He did not show any improvement and died on 3rd August, 1946, about 1 a.m.

A post-mortem examination was done on the 4th August by one of the writers (N. K. C.). The principal findings were as follows:—

Brain and the meninges.—The meningeal vessels were engorged. On incising the dura mater thick greenish yellow pus was found covering the surface of the brain and filling the sulci particularly over the vertex. accumulation was most marked over the area extending anteriorly from the occipital lobe over the parietal lobes to the frontal lobe. The fibrinous exudate formed a tough membrane which was most dense over the vertex (see The fibrino-purulent plate I). figure 1. exudate was also present though much less conspicuously on the undersurface of the temporal lobe. An area of hæmorrhage (subarachnoid) was noticed on the right parietal region. The ependymal lining of the lateral ventricle appeared rough as also that of the fourth ventricle.

The lungs and the pleuræ.—Both pleural cavities contained sero-sanguineous fluid, 20 oz. in the right and 7 oz. in the left. There were fibrous bands of adhesions on both sides. The right lung showed grey hepatization of the middle lobe and three small cavities with surrounding fibrosis at the apex. The left lung showed red hepatization of the lower lobe.

Heart.—Two milk spots were noticed on the anterior and posterior surfaces of the ventricles.

Spleen.—Enlarged, weight 420 gm., uniform congested appearance.

Liver.—Weight 1,450 gm., mottled nutmeg appearance.

Intestines.—Congestion of the Peyer's patches. Ten round worms were present.

Film from the pus over the surface of the brain showed gram-positive flame-shaped diplococci with capsules.

Histological examination of a section of the brain.—There was a thick layer of inflammatory exudate in the subarachnoid space covering the brain surface and filling the sulci (see figure 2, plate I). The exudate consisted of a network of fibrin entangling in its meshes the inflammatory cells which consisted mainly of polymorphonuclears. Lymphocytes and mononuclear cells were also present. Pneumococci were found in abundance inside the pus cells on staining the sections by modified gram's stain. Very little change was noticed in the brain substance. No leishmania were seen in the meningeal exudate.

Case 4.—An Indian male, aged 30 years, was admitted on the 30th November, 1946, for irregular attacks of fever, duration six months, and splenic enlargement, weakness, pallor, loss of weight, cedema of the legs, cough and purulent discharge from the ears.

On admission the patient was found to be thin and anæmic; there was ædema of the legs. Pulse/respiration = 100/24 per minute. Temperature 98.4°F. Heart: no abnormality. Lungs: signs of bronchitis. Liver enlarged up to 1 inch and the spleen up to $4\frac{1}{2}$ inches.

Laboratory reports

Blood count.—Hæmoglobin, 45 per cent = 6.18 gm. per cent; RBC 2.45 million; WBC 1,300 per c.mm., neutrophil 57 per cent, lymphocyte 34 per cent, monocyte 7 per cent, plasma cell and Türk cell 2 per cent.

Aldehyde, antimony and complement-fixation tests for kala-azar gave strongly positive reactions, and spleen puncture showed numerous leishmania.

Urine (12th December, 1946).—Albumin present, RBC present.

Fæces.—Ova of ascaris present.

With hospitalization and alkaline diurctics the patient improved considerably and the ædema subsided to a great extent. For the purulent discharge from the ears (subacute otitis media) local treatment was adopted. On 6th December, 1946, the discharge from the ears decreased to a great extent but the patient had severe rigor followed by high fever and later unconsciousness. No signs of meningitis were present but in view of the presence of otitis media he was put on sulphadiazine and penicillin. On the next day the patient regained consciousness and the fever down to 99-100°F. level. December, 1946, the patient was feeling quite normal and sulphadiazine was omitted though penicillin was continued. On 11th December, 1946, the specific treatment for kala-azar with pentamidine was commenced. The same evening the patient complained of severe headache and had a rise of temperature up to 101°F. The next morning he was unconscious and showed signs of meningitis. Lumbar puncture was done and about 20 c.c. of slightly turbid fluid under slightly increased pressure removed. Penicillin

10,000 units was administered intrathecally and sodium sulphadiazine 1 gm. intravenously. The patient did not regain consciousness and steadily went downhill and died next morning (13th December, 1946).

Examination of the cerebrospinal fluid showed

pneumococci.

Discussion

All the patients were suffering from kala-azar diagnosed by finding the parasite and/or the serum tests, of duration varying from 1½ to 6 months. They were profoundly anæmic, hæmoglobin varying from 4.67 to 6.18 gm. per 100 c.c. of blood, and the red cell count varying from 2 to about 2.5 million per c.mm. There was the usual leucopænia except in the ease that had pneumonia as well. Even before the onset of pneumococcal meningitis the patients were in a very poor state of health. As for the specific treatment of kala-azar, only one patient had 5 injections of an antimony compound and the others had not more than one or two injections of the specific drug.

The symptoms of meningitis came on suddenly while the patients were in the hospital under observation or symptomatic treatment. There was high fever with rigor followed by unconsciousness in case 1, and in cases 2 and 4 there were convulsions and severe headache respectively before the onset of coma. The usual physical signs seen at the onset of meningitis

were present in all cases.

Lumbar puncture showed that there was but little increase of pressure of the cerebrospinal fluid in the spinal canal. The fluid was by no means purulent; only slight haziness could be detected in the watery cerebrospinal fluid. In only one case a fine fibrinous clot formed on keeping the fluid. Pneumococci and neutrophils were detected in all cases but the number of cocci or of pus cells was not large in at least three cases out of the four. This was probably due to the leucopænia of kala-azar and the extremely rapid course of these cases, and the interference with the flow of the cerebrospinal fluid due to inflammatory changes. This character of the cerebrospinal fluid was rather unusual; the fluid is generally thick and purulent in pneumococcal meningitis, though Boyd (1940) has mentioned one case that showed almost normal cerebrospinal fluid.

Pneumococcal meningitis was apparently secondary to cancrum oris in case 2, to pneumonia in case 3 and to otitis media in case 4. In case 1 no primary source of infection could be found.

In the four cases reported above, the treatment consisted of sulphonamides given parenterally and orally and/or penicillin given intrathecally and intramuscularly (the latter route was adopted in order to combat the primary source of infection). But this was of no avail and death supervened within 24 to 36 hours of the onset of symptoms in all cases. It must be admitted however that penicillin was

administered intraspinally and not intracisternally or intraventricularly in this series of cases. The course of the disease was extremely short and the patients were in extremis within a few hours of the onset of the symptoms. Previous to the introduction of chemotherapy the usual duration of pneumococcal meningitis was about 3 to 4 days (Musser, 1938). The extremely rapid and fatal course of the disease was probably determined by the presence of kalazar that had already seriously affected the body resistance of the patients. The supervention of this complication in kala-azar leads to a rapidly fatal termination.

The post-mortem findings in one of the cases showed that there was an extensive involvement of the meninges over the brain particularly over the region of the vertex where a sheet of greenish yellow pus was seen in the subarachnoid space. The basal region also showed inflammatory changes and the lining membrane of the ventricles

was also affected.

Summary

Four cases of kala-azar complicated with pneumococcal meningitis are described. This complication was apparently secondary to cancrum oris in one case, to otitis media and pneumonia respectively in two others; in the remaining case it was primary. The postmortem findings in one case are described.

The course of the disease was extremely short and the fatal termination supervened within 24 to 36 hours of the onset of symptoms. The cerebrospinal fluid was but slightly hazy and watery and there was little increase of intraspinal pressure. Neutrophils and pneumococci were found but not in such large numbers as is usual in an average case of pneumococcal meningitis where the fluid is purulent and numerous pneumococci are found.

The treatment with penicillin intrathecally and/or sulphonamides was not followed by the

slightest improvement.

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TRIAL OF PENTAMIDINE ISOTHIONATE IN KALA-AZAR CASES IN THE PATNA MEDICAL COLLEGE HOSPITAL

(PRELIMINARY REPORT)

By S. M. GHOSAL, MR.C.P. (Lond.), FR.C.P. and

Y. K. SINHA, M.B., B.S.

Pentamidine isothionate was given trial in twenty cases of kala-azar from 3rd July, 1947 to 5th September, 1947.

The first ten cases were selected from amongst those in whom Leishman-Donovan bodies were seen in the sternal puncture smear. Incidentally all the cases had a positive aldehyde test. These cases were also investigated for the degree of anæmia as well as helminthic infestations and treated.

In the second ten cases, sternal puncture was negative in four and not done in six. In all the cases however the diagnosis of kala-azar was made on clinical grounds and was supported by positive aldehyde test

The standard dose, as recommended by May and Baker Laboratory, for pentamidine isothionate is intramuscular injection of 10 per cent solution of 4 to 5 mg. per kg. body-weight given daily for ten days only. This means that a man weighing 50 kg. will require 200 to 250 mg. of the medicine injected daily. Calculated in c.c. it comes to 2 to 2.5 c.c. per dose. A slightly smaller dose than this was given. The

Trial of pentamidine isothionate in kala-azar cases in the Patna

1			Ber	ORE START	ING I	FREAT	MENT	•		Five da	YS A	FTER	START	INĢ TI	REATMENT
Serial number	Name	Aldehyde test	Sternal puncture	Range of temperature, °F.	Size of spleen, inches.	Size of liver, inches	Body-weight, lb.	Blood	Anæmia and incidental disease:	Range of temperature, F.	Size of spleen, inches	Size of liver, inches	Body-weight, lb.	Blood	Treatment for incidental disease
1	R. S.	Positive	Positive	98–100	7	2½	102	2.50 40%	Anky- lostoma infec-	98-99	7	21	103	2.71 44%	Anthelmintic treatment + iron.
2	В.	**	"	98-99	2	1	98	2.88	tion.	97.8-98.4	11/2	1	101	3.10 47%	,,
3	K. P. G.	99	.,	98–103	21/2	1	102	44% 2.89	Anæmia	98–100	2	1	104	3.12 50%	Iron
4	S.	,,	23	100-103	21 1	112	89	46% 3.1 48%	Ring- worm infec- tion.	98-99	2	12	92	3.21 54%	Anti- ringworm treatment iron.
5	S. R.	,,	,,,	100-103	41/2	1	62	$\begin{array}{c} 2.52 \\ 40\% \end{array}$	Anæmia	98–100	4	1	66	$\frac{2.82}{46\%}$	11
6	B. S.	,,	,,	100-103	$3\frac{1}{2}$	1/2	158	3.15 50%	,,	9798.2	3	1/2	160	3.30 54%	Iron
7	A. J.	,,	,,	98–101	31/2	1	90		,,	97.4-98.6	3	3	96	$\frac{2.50}{45\%}$,,
8	т.	,,	,,	98102	5½	1	100		,,	98–100	5	1	86	1.80 34%	,,
9	B, S.	,,	٠,	98-103	$3\frac{1}{2}$	1	106	2.1 50%	,,	97.4-98.4	3	1/2	100	2.1 52%	21
	S. K.	,,	,,	100-102	31/2	1	122	2.22 45%	,,	98–101	31/2	1	124	2.50 50%	,,
10	I.	,,	Nega-	98–100	5	1	86	3.12 60%	,,	98-99	41/2	1/2	86	3.21 62%	11
11	D. M.	,,	tive.	98-99	5½	1	104		,,	98-98.4	5	1	99	3.12 62%	21
12	D. N.	,,	,,	98-103	11/2	1 1	114		,,	97–98.4	1 3		116	3.40 64%	
13	Hathwa 4.			98-102	31/2	1/2	62	1.89	,,	98–100	3	1	68	2.20 40%	,,
14	Hathwa 15. F. M.	1	Not	98-102	13	1 1	96		,,	98–100	1	1 1	94		99 1
15	Hathwa 11. G. R.	1	done.	98–100	2	1/2	102	2.64	"	98-98.8	11/2	1/2	98		, 11
16	Hathwa 3A. R. S.	j	•	97–98.9	8	1 1	126	44% 3.21	,,	97–98.4	7	1/2	131		,,
17	Hathwa 15A M. K.	1	• "	100-101		1	84	50%	,,	97.4-98.4	2	1/2	88		• ••
18	Hathwa 2.	, "	1	98-99	3	· 1	84	38% 2.51	,,,	97-98	2	1 1	85		. 4 ,,,
19	Hathwa 16	1	"	99-102		1	90	41%	,,	97.6-98.4	2	1	94		17
20	N. M. 11	,,	,,		1			46%					1	İ	i
		<u>'</u>		(1)	Ble	ood—	-Tota	1 RBC	in mill	ions per c.	mm.	Hb.	expi	ressed	in percentage.

procedure adopted was to begin with 1 c.c. of 10 per cent solution on the first day, to inject 1.5 c.c. on the second day and 2 c.c. on the third and subsequent seven days. A total of 10 deep intramuscular injections was given on ten con-

secutive days. For the criterion of recovery the following

facts were taken into consideration :-

(1) Range of temperature. (2) Size of spleen and liver.

(3) Feeling of well-being of the patient.

(4) Hæmoglobin and RBC content of blood.

(5) Body-weight.

The following observations were made :-

(1) Temperature usually touched normal after 5 to 6 injections—in 5 cases it took 8 injections for the temperature to touch normal. In one case the temperature did not come to normal at all. The size of the spleen and liver according to expectations. decreased possibility of pulmonary tuberculosis was considered. The skingram of the chest at this stage

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Medical	College	Hospital	(preliminary	report)
		-		

Ten da	YS AI	FTER	STARTIN	G TREA	TMENT	A WEEK	OR MO	DRE A	FTEB	COMPLE	TING -	i t	
Range of temperature, 'P.	Size of spleen, inches	Size of liver, inches	Body-weight, lb.	Blood	Treatment for incidental disease	Range of temperature, °F.	Size of spleen, inches	Size of liver, inches	Body-weight, 1b.	Blood	Treatment for incidental disease	Remarks	
97-98	6	21/2	106	3.01 48%	(2) Anthel- mintic treatment	97-98	5	2	108	3.25 50%	Iron		
97-98.2	1	Ŧ	102	3.22	given.	97-98.2	1	3	104	3.25 52%	,,	1	
98-98.4	2	1 1	108	50% 3.25	Iron			•		0270	••		
97-98	1	1 1	96	52% 3.40 60%	,,,	97-98	1		102	3.62 68%	Iron		
97–98	31	1 1	70	2.90 48%		••				ļ ••			
96.8-97.6	2	1/2	168	3.60							••		
97 4–98 4	2	1/2	98	2.85									
97 2-98 4	4	7	90	2.10									
97 6–98 2	2	1 -	104	2.25 56%						ļ	• • •	(After 3 weeks turned up wifever of 102°F. No enlarge	
97 6–98.4	3	<u> </u>	128	285		••						ment in size of spleen and liv Became afebrile without a	
97.1-98	3 <u>1</u>		90	3.25 64%						l		treatment. Discharged af 5 days.)	
97–98 1	1	1	104	3.25		••				i	••		
97-98.2	!	١.	118	3.50 68%		98.2	1		126	4.1 74%	Iron		
97-98.4	1	1	64	2.25 42%	Iron						••		
98100	• -	٠	90	3.4 52%	,,	••				••		(Urea stibamine resistant cas did not become afebri	
97 8-98.4	1		101	2.85 48%	,,	••				••		although there is marked dir	
97-98.2		1	134	4.1 60%	,,	••				• •		liver. Prolonged rest in b	
97.4–98		• •	90	2.80 44%	,,	••				••		for 2 weeks resulted in coplete recovery.)	
97-98			88	3.1 47%	,,	••						-	
97.1-98	3 1 1	1	96	3.51 50%	,,	••							

Leishman-Donovan bodies present. Negative: Leishman-Donovan bodies not present.

revealed no evidence of tuberculosis of the lungs. Prolonged rest in bed resulted in complete recovery in two weeks. The spleen and liver which disappeared during pentamidine therapy were never palpable during this febrile period.

(2) The spleen invariably diminished in size along with the drop in temperature. This decrease in size varied from half to one inch per

five-day time period.

(3) The patient felt markedly improved as

soon as the temperature touched normal.

(4) There was general improvement in the health of the patient as evidenced by increase in body-weight, hæmoglobin percentage and RBC count. There was steady increase in body-weight of 16 patients which varied from 1 to 8 lb.

In three patients the weight decreased from 6 to 1 lb. and in one there was no alteration in

the body-weight.

(5) No relapse was found in any of the cases so far observed. One patient turned up after three weeks with fever of 102°F, but there was no enlargement in the size of the spleen. No anti-kala-azar treatment was given. He was dis-

charged cured after five days.

Reactions to injections.—(1) There was no general reaction in any case. Local reactions which were quite common consisted of a brawny swelling without redness at the site of injection. This occupied a circular or oval area of maximum diameter of $1\frac{1}{2}$ inches to 2 inches. This was tender and was dealt with by hot fomentation. The inflammation passed off in three to four days. The site of injection was changed daily. In no case there was local suppuration.

(2) There was a tendency to bleeding from the needle track for some time after the injection. This was first dealt with by sealing with cotton-wool and tine, benzoin co. In some cases the sealing material was soaked in blood even 20 to 30 minutes after injection. Finally a plan was hit upon to stop the bleeding. Before the needle was withdrawn completely, an air bubble was injected into the subcutaneous tissue. This air bubble had to be drawn in the syringe along with the medicine before the needle was inserted for the intramuscular injection.

Summary

Pentamidine isothionate injection given in 20 cases of kala-azar resulted in temporary freedom from all symptoms (clinical recovery). The course of treatment consisted of daily intramuscular injections for ten days.

GIARDIASIS IN CHILDREN

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INFECTION of the intestinal flagellate Giardia intestinalis in man has long been recognized. One of the earliest workers in this direction,

Manson-Bahr reports its incidence between 4 to 16 per cent in people of the tropical countries, being in children three times more common than in adults. Chopra, Das Gupta, Sen and Ahmed (1939) from an examination of the stools of persons in a period of four years showed the incidence on an average to be 6 per cent. The sites of the intestine harbouring the parasites are the duodenum and jejunum and occasionally they are present in the gall bladder too.

Opinions are divided regarding the pathological manifestations of the flagellates. Silverton and Bernardino are of opinion that the fact that the infection as well as the symptom disappeared after treatment with atebrin proved beyond doubt the pathogenicity of the flagellates. Chopra et al. (1939) from a routine study of the stools of the patients, the symptoms and the response to treatment with atebrin consider that 'In some cases at least infection with Giardia intestinalis is responsible for intestinal disturbances specially in children'. The textbook description of the infection and its symptoms is hardly complete. The scant attention paid to the subject is reflected in the fact that authorities like Manson-Bahr (1945) and Price (1938) devote very little space in their books on this condition. How markedly opinion is divided as to the symptoms of giardiasis becomes evident from the report of the meeting of the section of medicine of the Royal Academy of Medicine in Ireland at which FitzGerald (1943) observed that 'Giardia were likely to be absent if blood was present in stools in any quantity'. Ruge (1930), however, observes 'that particularly amongst children in tropical climates, giardiasis appears not uncommonly as a typical dysentery. Sometimes even it may produce a picture closely resembling cholera'.

Cases of giardia infection with definite signs and symptoms have been described by Andleigh, Pant and Ray (1942), Bhattacharjea (1943) and Treu (1944). The last named writer has classified the infection into three groups: (i) infection without clinical significance, (ii) massive infection of the colon with symptoms of dysentery more commonly seen in children and (iii) infection of the small intestine with a variety of symptoms usually but not exclusively seen in adults.

During the last two years the writer had occasion to treat and follow the course of about one hundred cases of children suffering from bowel troubles. Out of these cases ten children had definite infection with Giardia intestinalis. The variety of symptoms they showed at different periods and their response to treatment have been noted in their case notes. Nine of them were under five years of age and the treatment adopted was either with atebrin or with mepacrine. Subsequent examinations of stool at regular intervals have been made to note either the presence or absence of the protozoa with or without symptoms. Excepting two cases

there has been no relapse of symptoms but in all the ten cases the stools have shown giardia or their cysts after an average period of two months from the end of the course of treatment though the motility of the parasites was much restricted and their number was considerably less. In a relapse the motility again increased.

Besides individual variations, some observations in common have been noted in these

children.

Stool.—Variation in colour and consistency was a marked feature in all the cases. Every child at some period or other during the course of infection had white fatty stools—some suffering from the very start and some after a period of bloody mucoid stools. The odour was invariably offensive though the chemical reaction was variable. Presence of motile flagellates in all the stools of children was a common feature.

Flatulence was marked in all the cases.

Prostration was proportionate with the duration of the disease.

Anamia.—Every child was anamic to some

degree.

General appearance.—There was no sign of any toxemia, the children looked well in spite of diarrhea, anemia and prostration.

Tongue was remarkably clear and moist.

Appetite.—In all the children the appetite was

definitely poor.

Remission.—There was regular remission of symptoms coinciding frequently with some forms of treatment. During the remission the child had good appetite and passed apparently good motions. The longer the period of remission the greater was the recoupment of the health of the child. Thus sometimes the apparently severe cases were not much prostrated.

Case notes

Case 1.—S. M., a healthy male child, aged one year and four months, started passing white and offensive stools in February 1945. He was given calomel with bismuth in fractional doses and the diarrhoa stopped. For about a month the stools were reported to be unhealthy, sometimes solid and sometimes liquid with undigested food particles in them. One night at the end of March he suddenly had an attack of choleraic diarrhea without any apparent reason. The stools were absolutely liquid in consistency and passed without any effort but with a lot of wind in them. The frequency was 8 to 10 times in twelve hours. Along with the diarrhea there was vomiting and the stomach was so much irritable that even plain water could not be retained. There was offensive odour in every motion. Bi-intesti-phage (children) was administered and the attack responded very well. Thereafter the child continued passing semi-solid motions 4 to 6 times a day with an unusually offensive odour. After another month the mother thinking that the rice diet was not agreeing with the child began to substitute

fruit juice, whey water and ! Sattu Food '. In the middle of May, the writer was consulted again as the child had passed some blood along with The motions then had a green colour with streaks of blood in them. The stool was examined and motile forms of Giardia intestinalis were found in large numbers. Since atchrin was not available menacrine 1 tablet three times a day were given for five days. Within a week the stools became normal and the rice diet was again restored. The child improved in health considerably and did well till November 1946 when he had motions containing blood and mucus. Giardia intestinalis in motile form were found again in numbers and another course of mepacrine cured the child. Up till now the child has been doing well with no more relapses.

Case 2.—B. B., a female child, aged $2\frac{1}{2}$ years, had flatulence and diarrhæa for two months before she came under treatment in July 1945.

The history showed that the child never had the same type of motions even for a continuous period of five days. They were at first green in colour with liquid consistency, then changed to white fatty stools with blood and mucus and finally to liquid diarrhea. Bi-intesti-phage was first tried but the response was very poor. On examining the stools motile forms of Giardia intestinalis were found. The case was treated with mepacrine as in the first case and since then there has been no relapse.

Case 3.—H. J., a female child, aged 10 years, had the peculiar history of passing loose motions for about three months in summer season only for the last three years. March, April and May were very trying for her, the minimum daily average number of stools being eight. The motions were more liquid than solid in consistency and had a clay appearance with offensive odour. Prior to May 1946, she had already two courses of emetine hydrochlor injections as each time cysts of E. histolytica were found in stool. On examination motile forms of giardia were discovered in the stool. She was cured with a course of mepacrine though a recent examination still showed cysts of giardia.

Case 4.—T. D., a male child, aged two years, came under observation in June 1946 with a history of diarrhea, flatulence and occasional vomiting for the previous six months. The parents noticed very often copious mucus with a little semi-solid stool which was whitish in colour. Sometimes streaks of blood were found mixed with diarrheaic stool. Treatment given was with fractional doses of calomel, bismuth, stovarsol and kaolin but without much effect. As stools showed giardia in large numbers in motile state, atebrin was given and the condition was cured. Though there has been no relapse as yet, the last examination of stool in February 1947 showed cysts of giardia.

Case 5.—H. M., a male child, aged 4 years, suffered from flatulent abdomen with low temperature towards evening for a period of six months before he came under treatment in July

1946. No food agreed with him and he used to get troublesome flatulence specially towards evening. Very often he would complain of pain in the epigastrium and vomit. The frequency of stools was four to five a day and the motions were whitish in colour, semi-solid in consistency and of offensive odour. The child had treatment with stovarsol, carbarsone, castor oil emulsion, calcium and calomel but with no good result. Stools showed motile forms of Giardia intestinalis and the child was treated and cured with atebrin. There has been no report of relapse up till now.

Case 6.—N. M., male child, aged three years, had a history of blood and mucus in motions for a period of two months before he came under observation in November 1946. He was treated with Dagenan and sulphaguanidine with little or no beneficial effect. History revealed that prior to the passing of blood and mucus the child had broad motions of white colour with flatulence for a week. Stools showed motile forms of Giardia intestinalis and there was a speedy cure of the ailment with atebrin.

Case 7.—S. O., a female child, aged two years and two months, had a history of passing voluminous semi-solid stools of white colour and offensive odour for a period of three months prior to attendance in December 1946. The parents took the milk diet as the root cause of the evil and stopped it altogether. The child was practically starved with insufficient food but she continued to pass stools as before. Proprietary liver tonics, bismuth and sulphaguanidine were administered with no good results. Stools on examination showed motile giardia when a course of atebrin cured the child.

Case 8.—G. S., a male child, aged three years and six months, came under treatment in January 1947. The complaints were frothy mucoid semi-solid stools of white colour and offensive odour. Duration—two months. The child had previously suffered from green diarrhea for one month and a half and towards the last part of this period blood and mucus were passed along with the green stools. Treatments given were stovarsol, cibazol, bismuth and vitamins but there was no improvement. Stools on examination showed motile giardia and the child was cured with atebrin treatment. As early as March 1947 there was a relapse with symptoms of choleraic diarrhea but another course of mepacrine checked the process effectively.

mepacrine checked the process effectively.

Case 9.—T. G., a female child, aged nine months and of exceptionally good health, had a history of diarrhea of one month's duration prior to attendance in February 1947. The stool was greenish colour and liquid consistency and had foul odour. The green colour sometimes changed to whitish and at times it was accompanied with profuse mucus. At the time of my attendance the child had profuse watery motions with streaks of blood sticking to the bed clothes—the frequency being 20 to 25 times in 24 hours. Stools showed motile giardia and the condition was cured with atebrin.

Case 10.—B. O., a female child of ten months, had a history of irregular motions for the previous two months. The stools were at first as in white fatty diarrhea with offensive odour for a week, and then of various colours and consistency, the number varying from four to six in twenty-four hours. Proportionately greater frequency was observed at night than in the day time. The child came under treatment on 1st March, 1947. As the stools showed motile forms of giardia, a course of atebrin brought about a complete cure.

Remarks

Children have been observed to harbour the flagellate Giardia intestinalis in greater frequency than adults. The bowel of the child with unstable digestion and low resistance seems to act as a suitable nidus for the growth of the flagellates. A definite relation between the motility of the flagellates and the manifestation of the disease has been observed. At the height of the attack the flagellates were found not only in greater numbers but their motility was greatly accelerated. On the institution of treatment the protozoa first disappeared totally from the stools and thereafter when they reappeared their movements were much restricted. Thus in periodic examination of the stool when the motility of the protozoa is found to be rather brisk, a relapse may well be apprehended.

Among children (at least in my series of cases) those under five years of age are more liable to suffer from the disease than older ones.

It has been invariably observed that the remission of symptoms coincided with the institution of some forms of treatment. It is probable that the drug for the time being at least changed the flora of the intestine thus making the medium for the growth of the flagellates unsuitable with the result that the activity of the parasites got checked temporarily.

Massive infection of the colon specially seen in children as observed by Treu (1944) does not seem to be a constant factor. In my series most of the children had their sites of infection in the small intestine as manifested by the nature of stools. The infection of colon seems to be a late phenomenon, being a spread from the small intestine.

Diarrhea due to teething which is more common in children under five years of age is very likely to be confused with ailments consequent on giardiasis; as such unless a routine examination of stools is conducted the condition is likely to be easily missed.

My thanks are due to Dr. H. Jena, lady doctor, Bargarh Hospital, and Dr. L. M. Das, private practitioner, Bargarh, for their help in the examination and treatment of cases.

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SCRUB TYPHUS (MITE TYPHUS) IN BOMBAY WITH A REPORT ON THE ISOLATION OF CAUSAL RICKETTSIA*

By D. W. SOMAN

and

V, K. DAS MENON

(From the Haffkine Institute, Bombay)

Well-Felix reaction with blood of patients suffering from scrub typhus during its course shows significant agglutination titres against B. proteus XK strains. In Bombay, Patel (1940) reported on two cases but the titres were far below the diagnostic level. Later, two more cases clinically suspected and serologically confirmed were reported by Patel (1943) and Patel (1943). Systematic Weil-Felix reactions, carried out during 1945 by Savoor and by the senior author in 1946, revealed 11 and 16 cases of scrub typhus respectively. Although the scrological evidence by Weil-Felix test, considered along with the clinical findings, was quite suggestive of the diagnosis of the scrub typhus, the ætiological confirmation was lacking. The object of this communication is, therefore, primarily to report on the ætiological basis of this disease by animal inoculation and isolation of causal rickettsia and subsequently to show that the infectious agent can occur in a metropolitan city like Bombay, upsetting the popular belief in its rural distribution.

Material for examination was received during the course of routine examination of sera from pyrexial cases sent for Widal tests by hospitals and private practitioners. These were submitted to Weil-Felix reaction for evidence of typhus infection with the three known standard B. proteus strains killed by alcohol. The level of B. proteus OXK agglutinins of the Bombay population was first determined by testing 500 Wassermann sera and an equal number of Widal sera. On the basis of results obtained, the criteria of a positive serological diagnosis was accepted as a minimum agglutinin titre of 1:250 against an alcoholic B. proteus XK

antigen. 1,578 sera from pyrexial cases were thus examined during the year 1946 and only 31 samples derived from 16 cases were found to be OXK positive in a titre 1:250 or above. In 12 cases, attempts were made to recover the etiological agent *R. orientalis* by mice inoculation, but only in 8 was the rickettsial nature of the infection clearly established.

Laboratory-bred white mice were used for primary isolation of rickettsia, because of their high susceptibility to scrub typhus infection. Four mice were used for each case and each of them was inoculated intraperitoneally with 1 c.c. of suspension in physiological saline of the ground blood-clot, obtained from a serologically positive case. The animals usually became ill on 10th day when they were killed and examined.

Post-mortem findings.—Moderate to marked congestion of subcutaneous tissues was frequently noticed. The peritoneum was injected and there was usually a sticky, gelatinous exudate, mixed with shreds of fibrin. Frequently the peritoneal fluid was blood-stained, the spleen was usually enlarged 4 to 5 times the normal size, darkened in colour and covered with a thin, grey fibrous coating. Occasionally, there was a small pleural effusion but the lungs did not show any gross changes. Material scraped from the visceral surface of the peritoneum and stained by Giemsa's method showed the following characters of the peritoneal exudate. The predominant cellular content was lymphocytic but it also contained a considerable number of monocytes, endothelial cells and polymorphonuclear cells. Rickettsia were always found extracellularly and intracellularly in a characteristic grouping of clusters lying in the cytoplasm close to the nucleus of the large mesothelial cells which were either scraped or had been shed from the peritoneum (see figure 1, plate II). Rickettsia appeared as short, rod-shaped, bipolar staining bacilli, similar in morphology, distribution and staining characteristics to R. orientalis described by Japanese workers as the causal organism of tsutsugamushi disease in Japan. Once a strain was isolated it was maintained by serial passages in mice every ten days. Some of the clinical features, results of Weil-Felix reaction and rickettsial isolation from these cases are summarized in tables I and II. Table I comprises a series of 8 cases in which rickettsia were successfully demonstrated; the remaining 8 cases, shown in table II, were only serologically positive.

Observations and discussion

Clinical features.—All cases except two resembled mild enteric infection on clinical grounds but their blood cultures and Widal reactions were repeatedly negative. In two severe cases, evidence of mental disturbance such as drowsiness, insomnia and delirium was present even during early convalescence which was prolonged. In all cases, marked prostration was a characteristic feature.

^{*}This work has been carried out under the auspices of the Indian Research Fund Association.

A history of macular or maculo-papular rash was obtainable in 6 out of 12 cases. The rash appeared first on trunk and face and later extended to extremities. Occasionally the rash was only erythematous in type. Presence of rash is not at all characteristic of every case. The percentage of cases with rash varies with different observers.

A primary dermal lesion—the eschar—so pathognomonic of the disease—was not always present. In 12 cases in which it was particularly looked for, it was present in two cases only (table I, case nos. 2 and 4). In one case, it was a small necrotic ulcer 2 to 5 mm. in diameter, with punched out margins, in the right inguinal region (see plate II) and in the other, it was a small central black scab with a surrounding red areola in the left armpit. Proximal lymph glands draining the area were enlarged in both the cases. The frequency with which it is found varies from 60 to 100 per cent in different series of cases reported in literature but experience of other workers has shown that it may be overlooked unless every square inch of body surface is scrutinized. Many of the patients showed bronchial symptoms with dry cough. Only one case proved fatal in this series with broncho-pneumonia as complication (table I. case no. 7).

Laboratory findings.—The samples of blood for Widal or Weil-Felix were usually received after the 10th day of the fever. These showed presence of agglutinins only against B. proteus XK strain. In 7 cases, OXK titres were significantly high and caused no difficulty in diagnosis, but in one case (table I, case no. 5) it was actually below the diagnostic level and only the animal inoculation test clinched the diagnosis of scrub typhus. In 7 cases the titres recorded were not higher than 1:500 and remained low (table I, case nos. 5 and 8). These may be some of the low titre type cases similar to those of epidemic typhus referred to by Felix (1944) and of endemic typhus referred to by the senior author (1947). The titres obtained in these cases did not bear any constant relation to the day of disease.

Significant titres against B. proteus XK strain have been reported in relapsing fever by Robinson (1942), Elsdon-Dew (1943) and Zaraphonetis and others (1946) which require to be excluded from the diagnosis of scrub typhus. This exclusion should not be difficult.

Isolation of rickettsial strains.—In 12 cases where mice inoculation was done rickettsia were successfully demonstrated in 8. Intraperitoneal inoculation with whole blood is advocated in the early stages of disease for successful isolation but clotted blood was used in all these cases and in some of them very late in the course of disease as 16 to 22 days (table I, case nos. 1, 3 and 5). Some of the clots had to be kept in the refrigerator for 24 hours before inoculation. Sometimes, the first inoculation of mice with

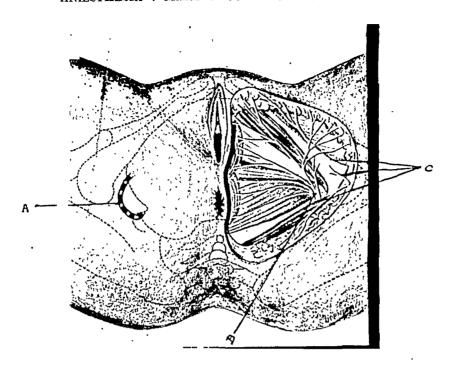
typhus blood failed to show typical post-mortem findings or presence of rickettsia, in which case the brain and spleen of these had to be regularly passaged two or three times. The strain once isolated was easily maintained in mice by serial intraperitoneal passages every 10 to 14 days. Intra-ocular inoculation of three human strains in 5 rabbits produced iridocyclitis. These reactions were initiated by injecting 0.1 c.c. of infected mouse peritoneal fluid in the anterior chamber of the rabbit's eye following the removal of like amount of aqueous humour (see figures 3 and 4, plate II).

Cross immunity experiments carried out in the rabbits by the intra-ocular method employing the homologous (Ceylon) strain of *R. orientalis* for immunization and challenge have demonstrated that complete immunity is usually, though not always, attained in rabbits so tested.

Epidemiological observations.—In spite of the lack of epidemiological data on the problem of scrub typhus in Bombay, a few significant points emerge from the observations embodied in this paper. The number of cases observed is so small that they may not have any statistical significance. Still, it was most striking that routine testing of 1,578 sera from pyrexial cases throughout the year gave only 31 samples positive to OXK type of agglutination derived from 16 cases; of these 14 cases occurred during the months of September, October and November. Savoor also met with similar experience, obtaining 11 serologically positive cases in Bombay in the same months during the year 1945 (personal communication). This seasonal incidence is similar to that found in most other countries where scrub typhus is prevalent. From June to September is the period of maximum rainfall, high temperature, luxurious vegetation, providing directly and indirectly suitable conditions for a rapid increase in mite population and a consequent rise in the number of cases.

Patients of all ages and both sexes suffered equally is evident from both the tables. A careful enquiry into the occupation of 8 cases in table I revealed that three females were household workers, two boys worked as waiters, two were police constables working in the districts and one, a clerk in the meteorological observatory. The areas in which the patients resided in Bombay were Colaba, Fort, Mahim and Girgaon. In four cases it was not possible to trace their residential areas. Three cases did not belong to Bombay City as they came from But others definitely districts or suburbs. denied any history of going outside the city limits at least a month prior to the attack. So far, cases of scrub typhus have never been reported from cities. Countryside, open grassy terrain, rural areas, coarse vegetation and shrubbery are the chief danger spots for scrub typhus infection. Hence occurrence of cases in Bombay is of more than ordinary interest. In view of the prolific rodent population of the city

PLATE I PELVIC FLOOR REPAIR UNDER PERINEO-PUDENDAL BLOCK ANÆSTHESIA: MARY P. JOHN. (O. A.) PAGE 6



- -Course of internal pudendal nerve over ischial spinc.
 -Branches of internal pudendal nerve.
 -Branches of posterior femoral cutaneous nerve.

OBSERVATIONS ON PNEUMOCOCCAL MENINGITIS AS A COMPLICATION OF KALA-AZAR: P. C. SEN GUPTA, K. N. BASU MALLIK & N. K. CHAKRAVARTY. (O. A.) PAGE 8



Fig. 2.

Fig. 1.

PLATE II

SCRUB TYPHUS (MITE TYPHUS) IN BOMBAY WITH A REPORT ON THE ISOLATION OF CAUSAL RICKETTSIA: D. W. SOMAN & V. K. DAS MENON. (O. A.) PAGE 17

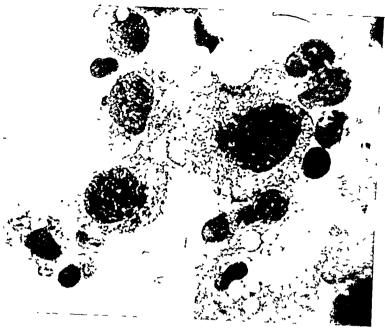




Fig. 1.

Fig 2

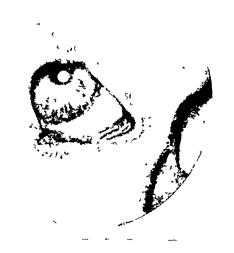


Fig. 3.—Normal eye of a rabbit.



Fig. 4.—Infected eye of a rabbit with the rickettsial virus.

TABLE I Showing important clinical features, results of Weil-Felix reaction and positive rickettsial isolation

			`				
Serial number	Month	Sex and age	Eschar	Rash	Day of disease	OXK titre	Mice inoculation
1	September	F., 19	Absent	Absent	21* 28 37 50	2500 2500 500 250	R. orientalis.
2	October	M., 10	Present	Absent	13* 14 22	500 1250 500	R. orientalis.
3	October	F., 20	Absent	Absent	18 22*	250 1250	R. orientalis.
4	October	M., 26	Present	Present	12 13* 19 27	1250 2500 1250 1250	R. orientalis.
5	October	M., 30	Absent	Absent	16* 27	125 50	R. orientalis.
6	October	M., 14	N.K.	N.K.	13* 17	250 1250	R. orientalis.
7	October	F, 63	Absent	Present	12*	500	R. orientalis.
8	November	M., 45	Absent	Present	13* 22	250 50	R. orientalis.

M.= Male; F.= Female; figures after M. and F. represent their ages. N.K.= Not known. * means the day of disease on which blood was inoculated into mice.

TABLE II Showing important clinical features of Weil-Felix positive cases only

Serial number	Month	Sex and age	Eschar	Rash	Day of disease	OXK titre	Mice inoculation
1	April	M., 28	N.K.	N.K.	14	250	N.D.
2	August	М,	N.K.	N.K.	13 17	125 500	N.D.
3	September	М.,	N.K.	N.K.	19	500	N.D.
4	October	F., 22	Absent	Absent	18 22*	250 500	_
5	October	F., 12	Absent	Present	7 13* 15	125 50 50	_
6	November	F., 19	Absent	Present	11* 19	125 125	_
7	November	M., 30	Absent	Present	15*	5000	_
8	November	M., 35	Absent	Absent	12 16	1250 2500	N.D.

M. = Male; F. = Female; figures after M. and F. represent their ages.

N.K. = Not known; N.D. = Not done; * means the day on which blood was inoculated into mice;

means rickettsia could not be demonstrated by animal inoculations.

it is not surprising that they should harbour larval mites and get infected from time to time.

species of Trombiculid larva is responsible for the disease in Bombay and what species of It would be worth while to investigate what | Bombay rats harbour the infection.

Conclusions

That scrub typhus infection occurs in Bombay is now definitely established by the isolation of the ætiological agent R. orientalis, and its confirmation by cross immunity tests with a known strain. Similarly the collected data of two years' work in Bombay lead inescapably to the con-clusion that scrub typhus may be acquired during the months of September. October and November. Many of these cases presenting serological evidence have been shown to be clinically atypical with or without rash or the primary eschar. Therefore, it is now left to the physician to be on the lookout for such cases and study in detail the symptomatology of the disease and to the epidemiologist to establish the arthropod vector and the rodent reservoir in this area. Observations in connection with the latter are in progress and will be reported when sufficient data is collected.

Summary

Sixteen cases of scrub typhus serologically diagnosed have been recorded, in eight of which isolated. been rickettsiæ have causal Methods of isolation of rickettsia from human cases have been described. These cases usually occurred in the months of September, October and November after cessation of rains and it has been shown that even a metropolitan city like Bombay is not free from this infection.

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TYPHUS IN BOMBAY

PART I: CLINICAL FEATURES

By S. R. SAVOOR N. S. VAHIA and

D. W. SOMAN

(An Enquiry under the Indian Research Fund Association, Haffkine Institute, Parel, Bombay)

Introduction .- With the spread of the war to the Middle East, when evacuees began to pour into Bombay from areas where typhus, both louse-borne and flea-borne, is endemic, it was felt in 1942 that a close watch had to be kept for typhus-like fever in the city.

Freedom from epidemic typhus, at least for the past fifty years, had unfortunately produced an impression amongst the physicians as well as the public health personnel that typhus was not present in Bombay. It is regrettable

that this false sense of security should have prevailed also in other parts of India, in spite of the fact that localized outbreaks had occurred from time to time in the mountainous regions of the north, and in the Frontier Provinces. Covell (1936) has given references to historical outbreaks of typhus in various parts of India and more recently Sharma (1940) has given an account of non-epidemic typhus in the civil population of Bangalore.

During the period 1914-20, only 3 cases of 'typhus', 2 in 1917 and 1 in 1918, were reported by the Executive Health Officer of the Bombay Municipal Corporation. In the City Fever Hospital (for infectious diseases) according to Patel (1940) no cases had been diagnosed for the period 1921-38. In the following year, however, 10 cases were found. This finding was commented on by him as follows: disease (typhus) seems to be occurring sporadically in the city. This year there were 10 cases reported from the City Fever Hospital. Most of the cases were in the indigenous population and were found to be occurring in the different parts of the city. They were all of a mild type. By a proper clinical and serological examination many more could be isolated if they were looked for ' (italies ours).

In the succeeding years from the same hospital were recorded 5, 2 and 2 cases respectively for the years 1940-41, 1941-42 and 1943-44. An account of the 15 cases that had been diagnosed at the same hospital has (1940a, .1940b). published by Patel sufficient interest was not created by these cases. In the Haffkine Institute where annually nearly a thousand samples of blood were examined for the Widal reactions, for the 3-year period 1939-41, only 19 were submitted for the Weil-

Felix reaction.

Though the war had not then spread to the western shores of India, in the middle part of 1943, on account of the overcrowding in the city, and the relative scarcity of food and of clothing, the economic conditions were steadily deteriorating to those which are usually regarded as favourable to the spread of epidemic typhus. Accordingly, a typhus enquiry was formed in the Haffkine Institute which was later financed by the Indian Research Fund Association.

Procedure.—Three objectives were kept in mind in this typhus enquiry: (1) identifying cases of typhus, (2) investigation of epidemiology and endemiology, (3) isolation and identification of typhus strains. Closely associated with the above was the clinical study of these cases. This was undertaken by the authors with a view to determining the symptomatology Though the of the disease in Bombay. pathology of typhus is the same wherever it occurs, it is a well-recognized observation that clinical differences exist, in the severity or mildness, the presence or absence of rash and in case mortality. Out of more than 200 cases diagnosed during 2 years, seventy hospital cases were closely studied. Particular attention has been drawn towards these features in the

clinical account given below.

The routine diagnosis was the Weil-Felix reaction carried out on sera from pyrexial cases sent to the Haffkine Institute for the Widal reaction. To rapidly identify typhus cases in the event of a sudden epidemic breaking out in the city, the various methods of bed-side (slide) diagnosis were tried and an easy method worked out. A short note on this has been included in the appendix. The Weil-Felix reactions were carried out using suspensions of Proteus OX19 and OX2, killed by alcohol and standardized in the manner described by Bridges (1935, 1944). The agglutinations were carried out in round-bottom tubes 2 inches in length, at 52°C. for 2 hours; and the results were read after the above had been kept at room temperature for a further 18 hours.

Serological criteria for positive cases.— Agglutination reactions using Proteus suspensions carried out on one hundred samples of serum from non-pyrexial cases (sera sent for the Wassermann test) and fifty pyrexial cases (nontyphus) such as influenza, enteric, etc., gave the

following results:-

that six cases of scrub typhus were seen in a period of 6 months. An account of four out of these six has been reported in this journal (I.M.G., 82, 649). Thus it will be noted that the three scrological types of typhus are present in Bombay.

Clinical course of the disease .- The seventy cases, on which the following study is based, came from four hospitals; this was done designedly. Situated in different parts of the city, these hospitals serve people of different social strata. Consequently it was hoped that data of epidemiological value would be available. All the cases were seen by one or other of the authors in conjunction with the respective physicians of the hospitals concerned. The material for the clinical study was from notes and histories taken by the physicians. Though there have been variations in the symptom-complex from one case to another, from the study of the seventy cases it has been possible to draw a composite clinical picture of typhus as it occurs in Bombay.

Onset.—Approximately one-third of the number of cases gave a history of sudden onset, some with rigors, others with a sensation of chilliness. In only one instance did the disease

Table I
Agglutinating titres against Proteus X suspensions of normal sera

	Proteus OX19				Proteus OX2				Proteus OXK			
	F	ositive		Negative	Positive			Negative	Positive		Negative	
Sera	1/50	1/125	1/250		1/50	1/125	1/250		1/50	1/125	1/250	••
100 non-pyrexial cases. Wassermann sera.	10	1	0	89	16	5	0	79	13	5	0	82
50 pyrexial cases	7	1	0	42	10	3	1*	36	8	3	0	39

^{*}Agglutination reaction carried out at 5-day intervals gave a stationary reading in this one case.

An agglutination reaction in a dilution 1/250 was, therefore, considered to be diagnostic of

typhus.

Serological types of typhus present in Bombay.—The routine Weil-Felix reactions carried out during the first six months of investigation revealed only one serological type to exist, viz, that corresponding to Proteus OX19. In these cases agglutination was also obtained with Proteus OX2 but in a much lower titre. Later two cases of typhus were met with in which the agglutination reaction was principally against OX2. As scrub typhus is principally a disease of the countryside and not of the metropolis, and as no cases of this type were met with in the first six months of the investigation, the routine testing of the sera with Proteus OXK was discontinued. But from June 1945 all the three types of Proteus X were used for routine Weil-Felix reactions with the result

commence with vomiting; in another there was retention of urine for 2 days. An equal number complained of prodromal malaise or lassitude. In every instance headache was a constant feature of the illness. Anorexia was usual.

Fever.—In general the fever ran a mild course and but for the systematic examination of the blood for the Weil-Felix reaction it is almost certain that the majority of the cases might have been missed. The fever rose during the first two or three days to its maximum. In 94 per cent of the cases it did not exceed 103°F.; and in 21 or 30 per cent of the cases the maximum temperature attained was less than 102°F.; the temperature curve was more often continuous than remittent. The duration of the fever varied from 6 days in uncomplicated cases to 22 days in cases with bronchial or pulmonary complications. It was of 6 days' duration in 3 cases;

8 days in 2; 9 days in 1; 10 days in 7; 11 days in 6; 12 days in 9. The mean pyrexial period in uncomplicated cases was 12 days.

The fever came down by crisis in 10 cases (14 per cent) and by lysis in the rest. A few of the latter showed an intermittent fever for two or three days before the temperature came down to normal. Twelve cases (17 per cent) showed a secondary rise of temperature lasting for a day or two.

Rash.—A rash was seen in 17 cases (24 per cent). It appeared between the 5th and 8th day. In only 4 cases was the rash profuse. In the rest the rash consisted of macules sparsely distributed on the abdomen, chest, back and axilla, less frequently (in 8) on the extremities. It was noticed on the face in 2 cases. No rash was seen on the sole of the foot in any of the cases.

The rash when fresh was a rose-red coloured spot, barely perceptible to touch, round or oval in shape, 2 to 5 mm. in size, with an irregular outline, the margin gradually fading into the skin beyond. The rash faded on pressure. Subcuticular mottling of the rash, curiously enough, was not a constant feature nor was subcutaneous hæmorrhage seen. The rash, as a rule, disappeared in 2 to 3 days without desquamation. But in a few cases, when it persisted beyond this period, the rash became dark-brown in colour in some, petechial in others, and failed to disappear on pressure, and faded towards the end of the second week with desquamation. It is noteworthy that in any one individual only a few, not all the 'spots', passed through all the stages.

Nervous symptoms.—Headache was a constant symptom at onset. It was more frontal than occipital. There was no vertigo. Pain in the limbs, chest, back or the loins, and sometimes 'all over the body' was a common complaint. The headache was intense, 'splitting' in some but not in all. The average duration of headache was probably 4 to 5 days until toxemia clouded this symptom. Except in the very mild cases where the pyrexia was of short duration, 6 to 9 days, there was toxemia to a greater or lesser extent; this was noticeable in slow cerebration. Deafness, often symptom in epidemic and scrub typhus, was conspicuous by its absence. Delirium was seen in only 5 or 6 cases, and in only one of the two cases which were fatal was it of a violent type. Prostration was unusual. Coma and tremors were seen in one case only.

Respiratory system.—Next in importance to the pyrexia and headache were symptoms of the respiratory system, seen in 24 out of the 70 cases (33 per cent). 15 patients had cough with coryza and congestion of the fauces, pharyngitis or bronchitis. The rest had varying degrees of pulmonary involvement from crepitations at the base to patchy areas of broncho-pneumonia. Œdema of the lungs

supervened in one case of broncho-pneumonia, which proved fatal.

Circulatory system.—The circulatory system did not show any special peculiarity. The pulse was rapid, small and of low tension in the great majority of cases; and followed the fluctuations in temperature. There was cardiac weakness throughout the period of pyrexia and for two or three days during convalescence.

A leucocyte count was made in 56 cases. It was normal in 31; leucocytosis was noticed in 13 and leucopænia in 12. The differential count showed no abnormality. In three patients the leucopænia was marked, 2,000, 3,100 and 3,000 respectively. None died and convalescence was normal.

Alimentary system.—A furred tongue and anorexia present from the onset were constant features. The degree was no more than in other febrile conditions. An enlarged spleen which diminished in size during convalescence was noted in 17 cases. In only one instance was there enlargement of the liver.

Other clinical findings.—Nearly two-thirds of the cases had a mild suffusion of the eyes with accompanying photophobia. The eyes were half-closed, watery and faintly glistening, giving an anxious appearance. Two cases had albuminuria. The condition cleared up during convalescence. One patient had retention of urine for two days at the commencement of illness.

One case developed an attack of arthritis and synovitis. It was probably a flaring up of an old trouble. Further investigation was not possible.

Case mortality.—Two cases died, giving a mortality rate of 2.8 per cent. One of these cases was severe from the very commencement of the disease, with violent delirium and rigidity of neck. There was prostration, and later coma developed during which the patient died. The second death occurred in an individual who developed broncho-pneumonia and ædema of lungs, and died of a pulmonary infarct.

Diagnosis.—The laboratory diagnosis of the above cases was done as stated earlier, by means of the Weil-Felix reaction; a titre of not less than 1/250 was considered positive. A second serological examination was not possible in 11 out of the 70 cases; the rest showed either a waxing or a waning titre. The 70 cases gave positive agglutinating titres at the following dilutions: 9 at 1/250; 23 at 1/500; 19 at 1/250; 12 at 1/2,500 and 7 at 1/5,000.

Isolation of typhus strains.—Five strains were isolated. An account is given in the third part of this paper.

Commentary.—In general it may be stated that typhus in Bombay is a mild disease. The composite clinical picture from 70 cases showed that there is nothing to indicate that typhus in

Bombay differs materially from endemic fleaborne typhus in other parts of the world, except perhaps in the incidence of rash. The low mortality of 2.8 per cent compares favourably with the endemic typhus in U.S.A., where according to Gordon (1939) the fatality rate was 4.4 per cent in Alabama.

It may be permitted here to reflect briefly on the reasons why typhus cases were missed in the past. An average case sought admission to a hospital for a sudden onset of fever with pains in the limbs or loins, with perhaps pharyngeal or bronchial catarrh. As only a low-grade toxemia was present in such cases and the duration of fever in 25 to 30 per cent no more than 6 to 11 days, a typhus infection could hardly have been suspected by those unfamiliar with the disease. The rash was present in about 25 per cent of the cases. But the general impression of the physicians was that the rash should be a constant physical sign in typhus. When a rash was present it resembled that seen in typhoid, and a serological test was called for only for the enteric group of organisms. Further, as the case mortality rate in continued fevers with the symptom-complex mentioned above was low, Familiarity was never suspected. with a disease increases the case of clinical recognition. It is very gratifying to realize that since the typhus enquiry was started in the Haffkine Institute, the physicians and practitioners of Bombay have become familiar with this disease and cases of typhus are now diagnosed on purely clinical grounds and specimens of blood submitted for confirmation by serological means.

Summary.—A clinical account is given of 70 cases of endemic typhus in Bombay. The following were the prominent symptoms: sudden onset (30 per cent), headache in all fever of 12 days' mean duration, rash in 25 per cent of the cases and bronchial symptoms in 33 per cent and a case mortality of 2.8 per cent.

The superintendents and physicians of the G. T. Hospital, K. E. M. Hospital, St. George Hospital and the City Fever Hospital are thanked for their cooperation, facilities and help in the typhus enquiry.

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APPENDIX

A NOTE ON RAPID BED-SIDE DIAGNOSIS OF TYPHUS

In recent times many attempts have been made to evolve a simple method of diagnosing typhus at the bed-side. Castaneda and Silva (1940) modified the technique of slide diagnosis of typhoid fever described by Bass and Watkins (1910) and by Welch and Stuart (1936), for bed-side diagnosis of typhus fever. The method consisted in mixing a drop of patient's blood and a drop of formalin-killed suspension of Proteus OX19 in sodium citrate solution on a slide. The positive reaction was indicated by the formation within one minute of white clumps distributed at the periphery in the form of a ring. This method was improved independently by Vientemillas and Hallmann by the addition of methylene blue to the Proteus suspension which assisted in the reading of the results. Other modifications have been introduced by Tietz and Carle, Eyre and Brixteen and others, but are not in any sense helpful to the practitioners in India.

Most of the laboratories in India use an alcohol-killed suspension of Proteus OX19, prepared at Kasauli, Bombay or Madras, to carry out the Weil-Felix reaction. It appeared to us that if this suspension proved satisfactory for the diagnosis at the bed-side, it would be of great assistance to practitioners in the

Accordingly, to 5 c.c. of the standardized ('concentrated') suspension of OX19, 0.5 c.c. of Loffler's methylene blue was added and the resultant used as an antigen for the test. When the test was carried out in the manner described by Castaneda the following defects were noted: (a) the agglutinating clumps were very minute and required a hand lens for recognition, (b) the test was too 'sensitive' and was giving false reaction, (c) clotting of the blood interfered with the test. These defects were remedied as follows: test. These defects were remedied as follows:

(1) Making the suspension still more concentrated. A suspension about 3 times thicker than the 'concentrated' suspension proved satisfactory. (2) The addition of 0.5 per cent sodium citrate. The suspension preserved in 0.2 per cent formalin kept well for at least 1 month in a refrigerator. month in a refrigerator.

The following technique was employed in the examination of 250 samples :-

A drop of blood from the patient was taken on a slide, and a drop of the suspension of approximately similar volume placed beside it. The drops were mixed by means of a glass rod and the slide rocked. The time taken for agglutination was noted. The Weil-Felix reactions were carried out in parallel by the standard method on each sample of blood and the results compared. results compared.

The following observations were made:—
When the Weil-Felix titre was 1/500 or more the slide test was positive in less than 10 seconds; when the titre was 1/250 the slide test became positive in 1 minute. When the titre was between 1/125-1/250, the time taken was about 1 minute. It was noted that if clumping occurred after 1 minute the results were

not reliable.

If attention is paid to the time factor the results obtained by the slide test are reliable and appear to run parallel with the titres obtained by the Weil-Felix. The test finds its best use under field conditions by public health officials to diagnose cases of typhus in an epidemic outbreak. Practitioners in outstations, where there are no laboratory facilities, can take advantage of this simple test.

As the standardized Proteus suspensions are readily available, the suspension for the slide test can be made by a practitioner as follows:-

The bottle or ampoule of the suspension is placed in a vertical position in an ice-chest or refrigerator for 5 days by which time the Proteus organisms settle down. About 2/3 of the fairly clear liquid is then pipetted off. One small crystal of sodium citrate and one drop of Loffler's methylene blue are then added. This suspension is satisfactory for the test.

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SULPHADIAZINE AND SULPHAGUANI-DINE IN CHOLERA

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THE usefulness of sulphaguanidine in the treatment of cholera, especially in its early stage, was discussed in a previous paper published by the author (1945). The absorbable sulphonamides however do not appear to have been as yet much tried for the treatment of this disease. Hardy et al. (1943) and Hardy and Cummins (1943) published two papers indicating very good curative action of sulphadiazine in acute bacillary dysentery caused by the Shigella strains found in the United States. Griffiths (1942) found sulphadiazine and sulphathiazole effective against Vibrio choleræ in mice in vivo. Sadusk and Oswald (1943) also found sulphathiazole to be effective. The present author (1945) in a clinical trial in cholera found sulphathiazole much more toxic than sulphaguanidine. Less toxicity of sulphadiazine and its obvious usefulness in other acute intestinal infections prompted the author to give it a clinical trial in cholera cases admitted into the cholera ward of the Chittaranjan Hospital during the last epidemic in Calcutta For the sake of comparison sulphain 1947. guanidine or pulv. calomel was given to those cases where sulphadiazine was not administered. The period of observation lasted from March to July 1947. During this period the total number of patients treated for cholera was 293. Of these, 139 patients received sulphadiazine, 111 patients sulphaguanidine and 43 pulv. calomel. Cases admitted ranged from attacks of moderate severity with vomiting, purging with rice-water stools, anuria of about 6 to 8 hours' duration and feeble pulse, to cases of great severity with no perceptible radial pulse, more prolonged anuria and symptoms of dehydration and collapse more pronounced.

Treatment

As is well known, treatment of cholera, once the disease is fully established, practically resolves itself into combating severe dehydration and accompanying depletion of salts and colloids, and their effects on the circulatory system and renal function. If the above can be effectively treated, majority of the cases quickly recover. All the cases treated in this series required saline transfusions. 100 to 300 c.c. of a 25 per cent solution of glucose a day, intravenously, were

given as a routine to every patient in this series. In cases of babies 12.5 per cent solution was given intramuscularly or beneath the fascia lata, the quantity varying according to age. Atropine sulphate subcutaneously was also used as a routine in the acute phase in every case unless contra-indicated Analeptics and other drugs were used according to necessity. As mentioned above, either sulphadiazine or sulphaguanidine or pulv. calomel has been used as intestinal antiseptic in this series. The results of treatment may be grouped according to the severity of the cases, ages of the patients, and the drugs

Analysis	of	the	results	of	treatment
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Total number of deaths in this series	
series 45 Percentage of deaths 15.33 B. Total number of cases in this series without perceptible radial pulse at the time of admission 133 Total number of deaths amongst them 32	
Percentage of deaths 15.38 B. Total number of cases in this series without perceptible radial pulse at the time of admission 133 Total number of deaths amongst them 32	
B. Total number of cases in this series without perceptible radial pulse at the time of admission	
B. Total number of cases in this series without perceptible radial pulse at the time of admission	5
radial pulse at the time of admission 133 Total number of deaths amongst them 32	•
radial pulse at the time of admission 133 Total number of deaths amongst them 32	
mission 133 Total number of deaths amongst them 32	
Total number of deaths amongst them 32	
them \dots 32	
Percentage of deaths 24.06	6
C. Total number of patients in this	
series admitted with percept-	
ible radial pulse 160	
Total number of deaths amongst	
them 13	
Percentage of deaths 8.12	2

Results of treatment with sulphadiazine as intestinal antiseptic

A.	Total number of cases where sul-	
	phadiazine was used	139
	Total number of deaths in these	
	cases	23
	Percentage of deaths	16.5

N.B.—The above 23 deaths include 8 persons who had only 2.5 gm. to 4 gm. of sulphadiazine altogether before death, also one female patient carrying 7 months who died of complications of miscarriage, and 3 cases of children who had only 0.5 gm. to 1.25 gm. of sulphadiazine altogether before death. If these 12 cases are omitted from calculation death rate comes to 8.66 per cent.

100 100	
B. Number of cases without perceptible radial pulse at the time of admission in whom sulphadiazine was used. Number of deaths in these cases Percentage of deaths C. Number of cases with perceptible radial pulse at the time	68 17 25
of admission in whom sulpha- diazine was used Number of deaths amongst them Percentage of deaths	.71 6 8.45

						
Resu	lts of treatment with sulpho intestinal antiseptic	iguanidine as		the pati		
A.	Total number of cases received sulphaguanidir Total number of deaths in cases Percentage of deaths	who ne 111	children and value of a dru to study the esgroups.	old men g in this d ffect of the	usually high a Hence to asse isease it is imp drug on differe	ss the portant ent age
who haltoge exclud 3.49 p	ceptible radial pulse time of admission received sulphaguanid Number of deaths amongst	alphaguanidine e 5 cases are rate comes to c per- at the who ne . 49 c them 10 . 20.04 n per- at the who ine . 62 c them 4	A. Total neseric Total de Percenta B. Total nu on a Total de Percenta C. Total ne radi Total de Percenta Results of total neserical nese	number treates eaths among age of death admission aths among age of death umber with al pulse on eaths among age of death reatment wi childre umber of	st them st them h perceptible admission st them st them children who	41 13 31.7 17 8 47.06 24 5 20.8
Rest	Percentage of deaths alts of treatment with calon doses as intestinal antis		Total nu ther Percents	n ige of death	eaths amongst	20 8 40
A.	Total number of patients received calomel as int antiseptic Total number of deaths as them	s who estinal 43 mongst 8	cept time with Number	tible radial e of admi 1 sulphadiaz	amongst them	9 7 77.77
B.	Percentage of deaths Number of cases withou ceptible radial pulse time of admission received calomel Number of deaths amongs Percentage of deaths	at the who 16	1.5 gm. of sulp C. Number ible of sulp	hadiazine al of children radial puls admission lhadiazine	ceived only 0.5 together before with percept- se at the time treated with amongst them	
C.	Number of patients with p ible radial pulse at th of admission who re calomel Number of deaths amongs Percentage of deaths	e time eceived 27	Results of t A. Total m	nge of death reatment w in child umber of ch h sulphagua	s with sulphaguan lren wildren treated nidine	9.09
Tl tabu	ne above results may be su lar form as shown below :—	mmarized in a	Total n the	umber of de	eaths amongst	4 26.66
	Cases receiving	Percentage of deaths in cases with no radial pulse on admis- sion	Percentage of deaths in cases admitted with perceptible radial pulse	Average percentage of deaths in the group	Average percent deaths in the eliminating mocases and death other cause	tage of group ribund s from
Sulpl	nadiazine (139 cases) naguanidine (111 cases) mel (43 cases)	25.00 (68 cases) 20.04 (49 cases) 31.25 (16 cases)	8.45 (71 cases) 6.45 (62 cases) 11.1 (27 cases)	16.5 12.6 18.6	8.66 8.49 18.6	
Tota	1 293	32 out of 133 24.06	13 out of 160 8.12	15.35 15.35	(28)	~
					\	

73	37 1	·		
в.	Number of children admitted without perceptible radial pulse treated with sulpha-		C. Number of old men admitted with perceptible radial pulse treated with sulphaguanidine	. 3
	guanidine Number of deaths amongst them	4 1	Number of deaths amongst them	0
	Percentage of deaths	$2\overline{5}$	Percentage of deaths	0
C.	Number of children admitted with			U
	perceptible radial pulse		Results of treatment in the age group of	though
	treated with sulphaguanidine	11	12 years and below 50 years in this ser	ries
	Number of deaths amongst them Percentage of deaths	$\begin{array}{c} 3 \\ 27.27 \end{array}$	A. Total number of patients belong-	
	Results of treatment in old men	~	ing to this age group treated in this series	224
	(50 to 70 years)		Total number of deaths amongst.	
A.		OD.	them Percentage of deaths	27
	series Total number of deaths amongst	28	P Number of deaths	12.05
	them	5	B. Number of patients of this age group, admitted without per-	
	Percentage of deaths	17.85	ceptible radial pulse	102
В.	without perceptible radial		Number of deaths amongst them Percentage of deaths	20 19.6
	pulse	$\frac{14}{4}$	C. Number of patients of this group	
	Percentage of deaths .		admitted with perceptible radial pulse	122
C.	-Total number of old men admitted		Number of deaths amongst them	7
	with perceptible radial pulse	14	Percentage of deaths	5.73
	Number of deaths amongst them	1 7.1		
	Percentage of deaths	7.1	Results of treatment with sulphadiazin	e in
R	esults of treatment with sulphadia	zine	this age group	
	in old men		A. Total number of patients of this age group treated with sul-	
A.	Number of old men treated with		phadiazine	102
	sulphadiazine Number of deaths amongst them	17	Number of deaths amongst them	11
	Percentage of deaths	$2\overline{3}.5$	Percentage of deaths	10.78
В.	Number of old men admitted		B. Number of patients in this age group, admitted without per-	
	without perceptible radial	!	ceptible radial pulse, treated	
	pulse treated with sulpha- diazine	8	with sulphadiazine	51 7
	Number of deaths amongst them	3	Number of deaths amongst them Percentage of deaths	13.72
	Percentage of deaths	37.5	C. Number of patients in this age	
C.			group, admitted with percept-	
Ο.	with perceptible radial pulse		ible radial pulse, treated with	51
	treated with sulphadiazine	9	sulphadiazine	4
	Number of deaths amongst them	1	Percentage of deaths	7.84
	Percentage of deaths	11.1	,	•
Res	ults of treatment with sulphaguan	idine	Results of treatment with sulphaguanidin	ie in
100	in old men		this age group	
A.	Total number of old men treated with sulphaguanidine	9	A. Total number of patients in this age group treated with sul-	87
	Total number of deaths amongst	, }	phaguanidine Total number of deaths amongst	
	them	1 11.1	them \cdots	9
רד	Percentage of deaths Number of old men admitted	14.1	r of contrago of domain	10.34
B.	without perceptible radial		B. Number of patients in this age group, admitted without per-	
	pulse treated with sulpha-		ceptible radial pulse, treated	20
	guanidine	6	with sulphaguanidine	39 8
	Number of deaths amongst them	1 16.66	Number of deaths amongst them Percentage of deaths	20.51
	Percentage of deaths	16.66	Terebrake of govern	-

C. Number of patients in this age group, admitted with perceptible radial pulse, treated with sulphaguanidine ... 48

Number of deaths amongst them 1

Percentage of deaths ... 2.08

Results of treatment according to age group may be tabulated as below:—

noticed in this series. General anasarca occurred in 4 cases of whom 2 died and 2 were cured. This complication was more possibly due to extreme anemia of the patients while large amounts of saline had to be administered by continuous intravenous drip method in an attempt to combat repeated and persistent collapse. Examination of urine in one of these

	Death rate in children (7 months to 12 years)			Drath rate in old persons (50 years to 70 years)			DEATH RATE IN PERSONS ABOVE 12 YEARS AND BELOW 50 YEARS		
Drug used	No radial pulse on admission	Feeble radial pulse on admission	Average	No radial pulse on admission	Feeble radial pulse on admission	Average	No radial pulse on admission	Feeble radial pulse on admission	Average
Sulphadiazine Sulphaguanidine Calomel	77.77% (9* cnses) 25% (4 cases) 0% (4 cases)	9.09% (11 cases) 27.27% (11 cases) 50% (2 cases)	26.66% (15 cases)	(6 cases) No case	0%	23.5% (17 cases) 11.1% (9 cases)	13.72% (51 cases) 20.51% (39 cases) 41.66% (12 cases)	7.84% (51 cases) 2.08% (48 cases) 8.69% (23 cases)	. 20%

^{*}Three of these children received 0.5 gm. to 1.5 gm, sulphadiazine altogether.

Bacteriological observations

No bacteriological examination of the stool was possible during the period under review owing to complete cessation of the work of the pathological laboratory of the hospital caused by the civil unrest in the city, the hospital being situated in one of the worst affected areas. But in some previous years, out of 500 stools cultured from the cholera ward, 350 showed the growth of comma vibrio, i.e. 70 per cent were positive. All the cases in the present series, though their stools were not culturally examined, were clinically typical cholera cases, were practically all brought by ambulances from the affected localities and bustees, having fairly high death rate, and occurring during the epidemic.

Sulphadiazine

Dosage of sulphadiazine used.—War Department Technical Bulletin (1945) recommends the following dosage of sulphadiazine in acute bacillary dysentery: 2 gm. initially, followed by 1 gm. four times a day in the adult. In the present series the adults, on admission, received 2 gm. followed by 1 to 1.5 gm. 4-hourly till the colour of the stool changed to yellow or greenish yellow and the diarrhoa controlled. Dosage in children varied according to age. Average number of sulphadiazine required to change the colour of the stool in this series was 15 (7.5 gm.); maximum required-32 tablets, minimum-10 tablets of 0.5 gm. each. Average number of tablets required to control the diarrhœa was 26 (13 gm.); maximum required-40 tablets, minimum -13 tablets of 0.5 gm. each.

Complications.—No special complication which could be ascribed to sulphadiazine therapy was

cases showed only a trace of albumin and no other abnormality.

Sulphaguanidine

Dosage of sulphaguanidine used this year, in this series, was a little higher than that used in previous years. This increased dosage appears to have been more beneficial and has further diminished the death rate. The dosage used for adults has been 3 gm. (6 tablets) initially, followed by 2 gm. (4 tablets) 4-hourly till the colour of the stool changed and the diarrhea was controlled. Average quantity of sulphaguanidine required to change the colour of the stool to yellow or greenish yellow was 27 tablets (13.5 gm.); maximum required—37 tablets, minimum—18 tablets of 0.5 gm. each. Average quantity required to control the diarrhea was 32 tablets (16 gm.); maximum—42 tablets, minimum—22 tablets of 0.5 gm. each.

Complications.—One case had general anasarca as in cases with sulphadiazine. One case had fatal hæmatemesis. The cause of anasarca was probably that discussed before. Hæmatemesis might have been caused by probable previous gastro-duodenal mischief.

Discussion

As has been mentioned before, the main treatment of cholera, once the disease is fully developed, resolves itself into combating the effects of dehydration, and loss of salts and colloids, and the associated failure of circulation and kidney function. Little can be expected from the antiseptics at this stage except perhaps the benefit derived from the prevention of further growth of the causative organism. The course of the disease is rapid, coming and passing off like a storm. So to be really effective all the drugs meant for combating the comma

4/2

vibrio must be administered early, before the nethological rations of the latter are fully the first of the effects of the drugs used as intestinal antiseptics during this and previous observations amply corroborates this.

Regarding the actions of the two drugs studied in this series, both sulphaguanidine and sulphadiazine have been found effective in cholera, especially in the early stage and less severe cases. Though apparently the average death rate, and the death rates in children and old men have been somewhat higher with sulphadiazine than with sulphaguanidine, average death rates, excluding from both the groups the cases who could get only small quantity of either drug before death, or died of causes other than cholera, have been practically the same (8.66 per cent and 8.49 per cent). Also the average death rates in the age group belonging to cases above 12 years and less than 50 years, who constitute the majority of the cases, have been practically the same with both Total quantities of the drug the drugs. required to produce beneficial effects in a case on the average have been a little less with sulphadiazine than with sulphaguanidine. In this connection another fact may be mentioned here. Trial of sulphadiazine was commenced at the height of the epidemic and was the only drug of the kind available to the ward for some weeks. Serious toxic actions have not been seen with either of the drugs. General anasarca seen in a few cases in both the groups was probably due to other causes than the toxic effects of the drugs.

Summary

1. Both sulphaguanidine and sulphadiazine are beneficial in cholera. Mortality is much lower if sulphaguanidine or sulphadiazine can be administered before the disease is far advanced, or the attack is comparatively milder, than when treatment with them is commenced in the stage of collapse.

2. Death rate is much higher in children and old men than in the intermediate age group both with sulphadiazine and sulphaguanidine. With sulphadiazine average death rate appears to be higher in children and old men than with sulphaguanidine. In intermediate age group who constitute the majority of the cases, death rate is practically the same with both the drugs.

3. Taking the whole series into consideration, average death rate with sulphadiazine has been a little higher than with sulphaguanidine. But excluding the very bad cases who could take very little of the drugs before death, or deaths from other causes from calculation, average death rates become practically the same (8.66 per cent and 8.49 per cent) with sulphadiazine and sulphaguanidine.

4. The quantity of sulphadiazine required to produce beneficial effects was somewhat less than the quantity of sulphaguanidine required to produce the same.

5. Toxic effects which could be ascribed to either of these drugs were not noticed in this series. General anasarca noticed in a very few cases in both the groups might be due to other cases.

My thanks are due to Messrs. Lederle Laboratories Inc. of America, who supplied all the sulphadiazine used in this study, free of cost. I also take this opportunity to express my gratitude to the superintendent, resident physician, house physicians, nurses and other resident staff of the hospital who valiantly stayed in the hospital under most trying circumstances during the year-long civil unrest in the city, and but for whose untiring efforts it would have been impossible to carry out this observation.

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SURVIVAL OF PNEUMOCOCCI AND STREPTOCOCCI CULTURES IN THE DRY STATE

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THE following is an observation on the survival of dry cultures of pneumococci and streptococci for seven years under unusual and adverse conditions of storage.

Dry cultures of 27 pneumococci and 10 streptococci prepared by the Division of Laboratories and Research of the Department of Health of New York (Wadsworth, 1939) were given to the author on 17th July, 1940. All the cultures were examined between 21st and 24th February, 1947. The tubes were opened and subcultured in glucose broth and after an incubation period of nearly 18 hours were plated on blood agar plates.

The dates of preparation of the cultures and the survival period were as follows:

		3.7	Period of	SURVIVAL,					
Date of preparation .	Num- ber Survived		Years	Months					
Pneumococci									
March 1939 April 1939 June 1939 January 1940	1 1 14 11	1 1 1 4	8 7 7	ii 9 1					
Streptococci									
January 1940 February 1940	7 3	7	7 7	1					

Preparation of cultures.—The cultures were prepared according to the technique described by Wadsworth in the book 'Standard methods' of the above-mentioned laboratories and in brief is as follows. The streptococci are grown in 0.02 per cent glucose beef-infusion broth for approximately eighteen hours. Concentrated suspensions are prepared by centrifuging the broth cultures, discarding nine-tenths of the supernatant fluid, and re-suspending the cells in the remaining fluid. The pneumococci are grown on 5 per cent defibrinated horse-blood agar for about eighteen hours and suspended in a small quantity of beef-infusion broth to which 5 per cent defibrinated horse blood had been added. With a pipette 0.1 c.c. quantities are distributed into small tubes. The suspensions are then frozen and dried in vacuum in the frozen state.

Conditions of storage.—In July 1940 the tubes were packed in a box along with other articles. The box was booked in November 1940 with the railways from New York to San Francisco. where it was further booked with a shipping company. During its journey the box changed boats at Hawaii, Japan, Singapore and Rangoon. This journey occupied four months and the box was alternately in the hold of a ship or in a godown. It passed through changing climates, i.e., the cold winter of Japan to the warm tropical climate of Singapore. On arrival in India due to the exigencies of war service the cultures could not be looked after and remained packed in the same box. The box was stored at Amritsar in the Punjab. For four years and ten months it was in the basement of a house and the last fourteen months in an open verandah on the roof of the house fully exposed to the vagaries of the weather and a daily direct exposure to the sun for part of the day. The mean monthly temperature in Amritsar in December and January is nearly 40°F. and in June 106°F. but the lowest in winter may reach 31°F, and the highest in summer 115 to 120°F.

So far the record of survival of these dry cultures is eight to nine years when stored in an air-conditioned laboratory (personal communication from Dr. J. M. Caffey of the above laboratories where the cultures were prepared). The survival of seven pneumococci cultures out of twenty-seven and eight streptococci cultures out of ten for seven years under very adverse conditions adds greatly to the value and utility of the method to maintain stock culture or despatch them to long distances and promises the probability of their survival for much longer periods under good storage conditions.

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EXCRETION OF PHOSPHATASES*

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Introduction

THD determination of serum alkaline phosphatase in cases of bone tumours is a biochemical procedure of accepted diagnostic importance. It helps in differentiating between osteogenic sarcoma and other bone lesions. A considerable amount of work therefore has been carried out on this aspect of the problem by various workers such as Woodard and Higinbotham (1937), Franseen, Simmons and MacLean (1939), Cade, Maclagan and Townsend (1940) and many others. The elevation of phosphatase values in serum of patients with osteogenic sarcoma was attributed to the process of new bone formation in such types of tumours. It has been however seen that the elevation of serum phosphatase was a finding not always consistent with the lesion. In a small percentage of cases there was rise in serum phosphatase although the lesion was not proved to be osteogenic sarcoma by histological examination. Woodard and Higinbotham (1941) studied a large series of bone tumours and tried to correlate the serum phosphatase values with the type of tumour, the extent of its growth and the concentration of the enzyme in the tumour tissue. The authors however could not establish any relationship between the concentration of the enzyme in the tumour and level of the serum phosphatase. Later Chitre (1943) and Pai (1944) from this laboratory corroborated these findings and it was suggested that the rise in serum phosphatase in bone tumours probably depended on some unknown factor or factors. It was thought also possible that the variation in the rates of excretion of this enzyme in different individuals might probably account for this discrepancy. Similar discrepancies have also been reported by some workers in the case of serum acid phosphatase and prostate tumour [Sullivan, Gutman and Gutman (1942); Herger and Sauer (1942)]. It was therefore thought worth while to try to investigate and understand more about this phenomenon. In this paper are reported some findings about the levels of phosphatases in human blood and their urinary excretions. , X.

Experimental

Acid and alkaline phosphatase determinations were made according to the method of Bodansky modified by Giri and Shourie (1939) using sodium glycerophosphate as the substrate. For the estimation of acid phosphatase the system was

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buffered at pH 5 with acetic acid-acetate buffer and for alkaline phosphatase at pH 9 with boric acid-Kcl buffer. Scott and Huggins (1942) during their investigation of the urinary excretion of phosphatases in human subjects dialized the urine in cellophane bags against distilled water in order to eliminate the interference of chromogenic substances. This method was found to be time-consuming hence as an alternative the following procedure was adopted:—

30 c.c. of buffered substrate solution was divided in three equal parts A, B and C. To A 1 c.c. distilled water and 1 c.c. of 0.01 MgCl₂ solution was added. To B and C 0.5 c.c. of distilled water and 1 c.c. MgCl, solution was added. All the tubes were warmed up to 37°C. To B 0.5 c.c. of urine was added and the tubes were incubated for a period of one hour. They were then cooled and to C 0.5 c.c. of urine and to A 1 c.c. of standard phosphatase solution was added. Three tubes were then treated in the usual manner for the estimation of phosphorus by Briggs' method (1922). Matching A against C would give inorganic phosphorus of the urine while matching A against B would give the inorganic phosphorus as well as the organic phosphorus set free by the enzyme. This modification eliminated to a great extent the influence of substrate or the chromogenic substances in the urine.

Firstly a day-to-day excretion of these enzymes was studied. For this purpose, three

normal individuals on mixed diet were chosen. Their single samples of urine during the interval of 4 hours after lunch were collected. This procedure of collection of the sample during a fixed interval was thought to give a fair idea about the 24 hours' excretion of the enzyme in these individuals, since the volumes voided per day as well as the pH of the urine were almost constant. Besides, the procedure enabled the estimations of the enzyme to be made on fresh samples. The results of these estimations are given in table Ia.

It will be seen from the table that there were large variations in the day-to-day excretion of the enzyme, although no such great variation was seen in the volume voided. It was thought that probably the variation was due to the effect of food intake, since the samples were taken after lunch. Three more subjects were therefore selected in whose cases the samples were taken on empty stomach. Their results are shown in table Ib.

In order to note the correlation of the level of the phosphatases in the blood and their excretion in the urine estimations in the urine and blood of few normal subjects were done. These are shown in table II.

Discussion

From tables Ia and Ib it could be seen that the daily excretion of acid phosphatases in the urine is not constant in the same individual.

Table Ia
Urinary excretion of phosphatases in human subjects (samples after food intake)

Number of days	pH of the	Excretion of phosphatase units		pH of the urine	Excretion of phosphatase units		pH of the urine	Excretion of phosphatase units	
		pH=5	pH = 9		pH = 5	pH=9		pH=5	pH=9
Subject No. 1			Su	вјест No.	2	S	uвјест No.	3	
1 2- 3 4 5 6	6.5 6.0 6.5 6.5 6.5 6.5 6.5	9.59 6.30 6.82 4.41 4.55 12.96 3.40	nil nil nil nil nil nil nil	7.5 7.2 7.3 7.0 7.3 7.3 8.0	14.35 9.69 5.60 11.10 5.50 6.20 2.20	2.05 nil nil nil nil 2.70 1.45	6.0 6.0 6.5 6.2 6.3 6.2	6.75 0.79 2.89 2.00 0.72 1.64 1.50	nil nil nil nil nil nil nil nil nil

Table Ib
(Samples before food intake)

	Subject No. 4		Subject No. 5			Subject No. 6			
1 2 3 4 5 6	7.3 7.0 8.0 7.2 7.5 7.2 7.0	15.39 11.05 2.15 1.94 2.62 4.80 3.00	2.83 nil 0.39 nil nil nil	6.0 6.2 6.0 6.0 6.0 6.5 6.0	1.33 2.10 21.37 7.37 3.76 3.85 7.28	nil 2.45 2.25 nil nil nil nil	6.0 6.3 6.5 6.7 6.7 6.5 6.0	6.93 6.70 2.22 2.93 4.94 7.87 7.11	nil nil nil nil nil nil

TABLE II Phosphatase contents of serum and wrine of. normal individuals

Num- ber	Age	Sex	tase in	ohospha- units cent	24 hours' excre- tion of phospha- tase in units		
			pH=5	pH = 9	pH=5	pH = 9	
1 2 3 4 5 6 7 8 9	24 25 24 23 25 25 25 25 20 20	M. M. M. M. M. M. M. M.	2.1 1.6 1.5 2.1 1.8 2.0 2.9 1.0 2.2 1.9	4.1 4.0 2.8 2.8 4.6 3.0 3.7 3.8 3.4 4.8	53.20 27.51 41.60 163.45 142.12 156.00 232.80 74.40 20.42 104.72	nil 14.82	

This variable rate of excretion could not be attributed either to the difference in food intake or to the pH of the urine voided by the subject since the pH of urine was almost constant from day to day and, secondly, the subjects examined before and after lunch showed similar variations. These findings are not in agreement with those of Scott and Huggins (loc. cit.) who have found that the excretion of acid phosphatase in the urine of human subjects was fairly constant and could be taken as a fair index of prostatic activity. From these results it is doubtful whether the excretion of acid phosphatase could give a satisfactory index of prostatic activity.

The only possible explanation that could be offered for this variable excretion is that it is almost certain that the prostate is not the only organ which elaborates acid enzyme and that therefore all the acid phosphatase of the urine is not identical with prostate phosphatase. This explanation sounds logical in the light of recent investigations by Herbert (1945) on the differentiation between prostatic phosphatase and other acid phosphatases in some pathological human sera. Authors have shown that there are at least two types of acid phosphatases in the pathological blood sera and one of them was probably identical with the prostatic phosphatase. Since metabolites in the blood are usually excreted in the urine, it should also contain more than one acid phosphatase. Hence it would be premature to conclude regarding the interdependence of the prostatic activity and the urinary excretion of acid phosphatase in human subjects unless more is known about the sources of acid phosphatase in the blood and the extent to which they contribute to total blood and urine phosphatase. The excretion of alkaline phosphatase was however very low.

In table II are given the values of blood phosphatases and urine phosphatases in some normal individuals. Here also no correlation could be seen between the level of the phosphatase in the blood and their exerction in twenty-four hours in an individual. Subjects having almost equal levels of the phosphatase in the blood excreted it to a variable extent in the urine. Here also traces of alkaline phosphatase were found in urine.

Summary and conclusions

The urinary excretion of acid and alkaline phosphatase has been studied in normal human subjects together with their levels in the blood. It was found that :-

1. Large amounts of acid phosphatase were excreted in the urine while the quantity of alkaline phosphatase was almost negligible.

2. The excretion of phosphatase varied from day to day in an individual and as such it was doubtful whether the excretion of acid phosphatase would serve as a suitable index of prostatic activity of an individual.

3. The day-to-day variation was not found to be dependent on the food intake or the pH of the urine since individuals examined both before and after food intake showed similar variations.

4. There was no correlation between the levels of phosphatases in the serum and their excretion in the urine in an individual.

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SEROLOGICAL TECHNIQUE (contd.) .

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COMPLEMENT-FIXATION REACTION BETWEEN SERUM-PROTEIN AND ITS ANTIBODY FOR MEDICO-LEGAL **PURPOSES**

Although complement-fixation is not likely to replace the precipitin reaction now universally employed for medico-legal purposes, it can help

in making distinctions between type specific and group specific reactions which may not be possible with the latter reaction. Examples of strong group specific reactions, in the precipitin reaction, are afforded by bloods of (1) sheep and goat, and (2) cow and buffalo. An antiserum prepared in fowls against sheep serum produces a ring of precipitate equally well with the goat or sheep serum, and an antiserum prepared against the goat serum also produces a ring of precipitate equally well with the sheep or goat serum. The same difficulty is encountered in dealing with the blood of cow and buffalo. Even the distinction between the bloods of cow (or buffalo; cow/buffalo hereafter) and sheep (or goat; sheep/goat hereafter) needs the use of specially selected antisera of equal potency and serial dilution of the extracts of material until one of the extracts fails to react.

With the antisera prepared in rabbits distinction between cow/buffalo and sheep/goat is easier and the one between cow and buffalo or between sheep and goat is possible by precipitin reaction. The possibility, however, is not always easily realized.

Complement-fixation succeeds, as a rule, in differentiating between the bloods of sheep and goat or cow and buffalo and makes a difference between sheep/goat and cow/buffalo much easier.

A Technique of Complement-Fixation between Sheep Serum-Protein and its Antibody

The hæmolytic system.—This is taken from the LCF reaction, including the choice of the complement.

The antigen—This is the normal sheep serum in a (1) constant 1 in 1,000 dilution in saline or (2) in serially weaker dilutions. In these dilutions it is not anti-complementary.

The antibody.—This is the antisheep serum produced in a rabbit. Intravenous injections of 2 c.c. of filtered and inactivated serum are given daily for 5 days. Five days after the last injection a sample of blood is taken from the ear vein. The serum (undiluted) from it should give a precipitin ring test as follows: (1) with a 1 in 1,000 dilution of the antigen a frank/sharp reaction in 2 minutes; (2) with a 1 in 20,000 dilution of the antigen a dubious reaction in 10 minutes and a frank/sharp reaction in 20 minutes; and (3) with a 1 in 40,000 dilution of the antigen a dubious reaction in 20 minutes. If the reaction does not come up to the standard another course of five intravenous injections is commenced.

If the reaction is up to the standard the rabbit is bled from the heart (not to death) 10 days after the last injection and the clear serum from the clot is inactivated and stored frozen in small bottles in lots of 0.2 c.c. It is thawed slowly 12 hours before use. Keeping the antigen constant the dilutions of the serum used are 1 in 100, 1 in 200 and 1 in 300. These dilutions are not anti-complementary. Alternatively, keeping the strongest dilution of the serum (1 in 100) constant, the dilutions of the antigen are weakened serially (1 in 10,000, 1 in 20,000).

Weak antisera with the limits of reaction fixed at 1,000, 5,000 and 10,000 (instead of at 1,000, 20,000 and 40,000) can also be employed. The dilutions used then are 1 in 25, 1 in 50 and 1 in 100 (instead of 1 in 100, 1 in 200 and 1 in 300). These dilutions should not be anti-complementary. Strong antisera are preferable and the dilutions in the ensemble are those of strong sera.

The ensemble.—Five tubes running in a row from left to right, not in a column from before backwards, are charged as follows:-

(1) With constant dose of antigen:—

. ,	For co	FOR TEST PROPER			
	1st tube (for antigen)	2nd tube (for antibody)	3rd tube	4th tube	5th tube
Antigen, 1 in 1,000: Antibody, 1 vol. of, 1 in: Complement, 1 vol. containing: Saline:	1 vol. 1 MHD 1 vol. Left at icc-b	100 1 MHD 1 vol. lox temperature 1 hour and in i	1 vol. 100 2 MHD 1 hour, at rencebator ½ h	1 vol. 200 2 MHD com	1 vol. 300 2 MHD
Sensitized rbc suspension:	1 vol.	1 vol.	1 vol.	1 vol.	1 vol.

Incubated 2 hour.

Negative (-) and doubtful (±) reactions recorded at once. Left at ice-box temperature overnight and positive (+) reaction or traces of lysis (T) recorded next morning.

(2) With constant dose of antiserum:

(2) With tonstand dose of anoison							
•	For controls			FOR TEST PROPER			
	1st tube (for antigen)	2nd tube (for antibody)	3rd tube	4th tub≏	5th tube		
Antigen, 1 vol. of, 1 in:	1,000		1,000	10,000	20,000		
Antibody, 1 in 100:	••	1 vol.	1 vol.	1 vol.	1 vol.		
Complement, in 1 vol. containing:	1 MHD	1 MHD	2 MIID	2 MHD	2 MHD		
Saline:	1 vol.	1 vol.	••	••	••		
	Left in ice-box, room and incubator as before.						
Sensitized rbc suspension:	1 vol.	1 vol.	1 vol.	1 vol.	1 vol.		

Sensitized the suspension

Incubated ½ hour.

—, ±, + and T reactions recorded as before.

The second scheme does not give as clear-cut reactions as the first scheme. Incomplete-fixation, however, is often observed even with the weakest dilution of the antigen.

5th tube of the 1st ensemble) for goat's serum (in which there is goat's serum in the place of sheep's serum) and one set like the sheep's serum set for cow's serum (in which there is

TEST PROPER

Typical results are:-

	1st tube (antigen)	2nd tube (antibody)	3rd tube	4th tube	5th tube
With constant antigen:	••	••	+	+	+/T/±
With constant serum:		• •	. +	+/T	T/±

CONTROLS

The reaction is the strongest in immunology. In both anaphylaxis (in which the weakest dilution of the reacting antigen may be of the order of 1 in 10 million in terms of serum-protein and 1 in 1 million in terms of serum) and precipitin reaction (in which the dilution of the serum in the writer's laboratory is of the order of 1 in 40,000) the antibody is used undiluted. In the complement-fixation under description both the antigen and the antibody are diluted. Besides, the permissible limit of the strongest dilution of the antigen for the other two reactions is the same as in this reaction, namely, 1 in 1,000 dilution of the serum.

Reaction of Antisera with Sera from Phylogenetically related Animals

In the first scheme of the ensemble, with constant dose of the antigen, are inserted the following additional tubes:—

In the controls, antigen from (i) goat and (ii) cow, i.e. one tube containing a 1 in 1,000 dilution of goat's normal serum and one tube containing a 1 in 1,000 dilution of cow's normal serum.

In the test proper, 2 sets of 3 tubes each for goat's and cow's serum, *i.e.* one set like the sheep's serum set (of 3rd tube, 4th tube and

cow's scrum in the place of sheep's scrum). Properly controlled sheep, goat and cow scra are tested with sheep antisera.

Typical results according to the first scheme are given below.

There is quantitative difference (different grades of reaction between + and —) between sheep and goat in the 2nd or 3rd tube and a qualitative difference (+/± in one and — in the other) between sheep and cow in the 3rd tube.

The quantitative difference between goat and sheep also occurs when antigoat serum is used in the test instead of the antisheep serum.

Similarly, the qualitative difference between cow and goat/sheep also occurs when anticow serum is used in the test instead of the antisheep serum.

The cow-buffalo relationship is of the same order as the sheep-goat relationship, with respect to themselves and other ruminants.

The results according to the second scheme, being less clear cut, are altogether quantitative.

The special feature of the technique is that the antiserum used is of a known precipitin titre, preferably a high titre. For anti-animal sera a high titre is easily obtained. For anti-human sera, however, a high titre of this order is difficult to obtain.

~	~			
Ų,	ON	TR	OL.	S

F	For antigen For antibody				TEST PROPER								
	Tubes		Tube		For she	ер		For go	at		For cow		
1 2 3 Sheep Goat Cow	4 (Anti-	Tubes			Tubes			Tubes					
	Cow		1	2	3	1	2	3	1	2	3		
			_	+	+	+/T/±	+	+	T/±/-	4-	+ / +	_	

Application of the Technique to Medicolegal Work

Problem.—Is the stain caused by human blood or goat's blood?

Case 1. The precipitin test shows the presence of both human blood and also the blood of a ruminant animal (tested with an antisheep serum).—The stain is, therefore, caused both by human blood and the blood of one of the following: (i) sheep and (ii) goat, constituting one sub-group, and (iii) cow and (iv) buffalo, constituting another sub-group, within the main group of ruminant animals. The reaction of the ruminant blood is strong, while that of the human blood though definite is not so strong.

Further precipion bests man serum and an antibuffalo serum prove the serum and an antibuffalo serum prove the blood of (i) or (ii) only. The Further precipitin tests with an antisheep distinction between these two animals cannot be made with certainty except by the complementfixation test.

The relative strength of the human serum and sheep-goat serum in the extract, the total serum content of which is of the order of 1 in 1,000 (by 'foam test'; by comparison of its foam with that of a known 1 in 1,000 dilution) must next be determined. If the two reactions in the precipitin test were of the same strength, the strength of the two sera would be of the order of 1 in 2,000. The reaction of the human blood being not so strong as that of the sheep-goat, the dilution of the two sera may be taken to be of the order of 1 in 2,500 and 1 in 1,500 respectively. Known controls of sheep and goat serum must, therefore, be 1 in 1,500. Greater accuracy is neither possible nor necessary. The significant differences in complement-fixation with varying quantities of the antigen are obtained with much larger gaps in dilution (1 in 1,000, 1 in 10,000 and 1 in 20,000, vide supra, second scheme).

The known sera in 1 in 1,500 dilution are put up side by side with the unknown serum (extract) as shown in the following ensemble:—

goat or unknown serum)

Test with antisheep scrum. Columns of tubes. (Each tube contains 1 vol. of a 1 in 1,500 dilution* of sheep. of a 1 in 1,500 dilution* of sheep. goat or unknown scrum)

	1	2	3 ·	1	2	3
	Sheep	Goat	Unknown	Sheep	Goat	Unknown
3rd row for 1 vol. of antiserum	300	300	300	300	300	300
diluted 1 in: 2nd row for 1 vol. of antiserum	200	200	200	200	200	200
diluted 1 in : 1st row for 1 vol. of antiserum diluted 1 in :	100	100	100	100	100	100

2 MHD of complement and, later, rbc suspension are added as before.

Typical results may be :-

					. 455%	
3rd row:	+/T	T	T	${f T}$	+/T	+/T
2nd row:	+/T	T/±	T/±	T/±	+/T	+/T
1st row:	+	+	+	+	+	+

^{*}The known dilutions should also be made equal by comparison of foam and further dilution of one of them if necessary.

The reaction of the unknown serum corresponds to that of the goat serum in both the sets. The unknown serum is, therefore, goat serum.

If the reaction of the unknown serum corresponded to that of the sheep serum the unknown serum would be sheep serum.

Probably the animal blood has been added to mask the reaction of the human blood.

Case 2. The precipitin test shows the presence of the blood of a ruminant animal only.—Further precipitin tests with antisheep and antibuffalo sera prove the presence of the blood of sheep or goat only.

From the stain make an extract corresponding to a 1 in 1,000 dilution of a serum and proceed as before with complement-fixation. The dilutions of the known sera will also be of the same strength.

Problem.—Is the flesh sold as mutton really goat flesh, beef, or dog flesh?

Muscle protein along with the protein of the blood contained in it from the flesh is dissolved in saline and used as the antigen, like the serum dilution. Its strength is determined by the 'foam test'.

For sending specimens to a distant laboratory, juice expressed from the flesh and dried on a chemically pure filter paper will suffice. Or a small piece of the flesh may be dried in a desiccator and sent.

A Difference between Antibodies produced against the same Serum-Protein but in Different Classes of Animals

The antisera for the precipitin test are prepared in the writer's laboratory from fowls (with the exception of the antifowl serum which is prepared from rabbits). Their titres are very high. They give with a 1 in 1,000 dilution of the appropriate serum a frank/sharp ring within 2 minutes; with a 1 in 20,000 dilution a dubious/frank ring in 10 minutes and a frank/sharp ring in 20 minutes; and with a 1 in 40,000 dilution a dubious ring in 20 minutes. These potent sera fail to fix complement when used as antibodies in the technique described, i.e. an antibody made in a bird does not work with the complement derived from a mammal.

The antigen and antibody work regardless of the class of animals they are derived from. This is established by fowl-rabbit antiserum, used as antibody in the technique described, fixing complement with fowl's serum, used as antigen.

(To be continued)

THE RELATIVE SUSCEPTIBILITY TO INFECTION AND THE RESPONSE TO IMMUNIZATION OF LABORATORY ANIMALS IN INDIA AND ABROAD

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THE Drugs Rules, 1945, framed under the Drugs Act, 1940, are more or less an exact replica of the Statutory Rules and Orders made under the Therapeutic Substances Act of Great Britain. The question of the differences in susceptibility and reactivity of laboratory animals in India and England has not been taken into consideration. Taylor and Ahuja (1935) reported that 'White mice bred in Kasauli from imported English stock have been found to show a susceptibility to the toxic action of Novarsenobenzene different from that of the parent herd from which they were derived'. The mice in England could tolerate a 43 per cent bigger dose than their offspring bred and reared in Kasauli. It is therefore essential to compare the response to injection of infective agents and antigens of laboratory animals in India and England before formulating any standards. The present work was undertaken to determine the response to the injection of (a) tetanus toxoid and (b) tubercle bacillus.

Tetanus toxoid.—The protocols of a number of tests carried out in England to determine the antigenicity of different batches of toxoid were obtained. A number of different batches of tetanus toxoid prepared in India and abroad were tested for antigenicity along with two samples of tetanus toxoid, the details of the tests of which were obtained from England. The guinea-pigs bred at the Central Research Institute, Kasauli, were used in the experiments carried out as follows:—

Each batch of tetanus toxoid was injected subcutaneously into a number of guinea-pigs weighing from 250 to 350 gm. in a dose of 5 c.c. The guinea-pigs were bled from the heart six weeks after the administration of the immunizing dose, the serum was separated and tested for the antibody content.

The results of the experiments are given in table I.

According to the Drugs Rules, out of the minimal number of nine guinea-pigs injected, two-thirds or more should contain 0.1 international unit or more of tetanus antitoxin per c.c. of serum, or alternatively one-third or more of the guinea-pigs tested should contain 1 international unit or more of tetanus antitoxin per c.c. of serum. Due to a scarcity of guinea-pigs of the standard weight, out of 12 batches tested 4 did not consist of the minimal number of nine guinea-pigs per batch. It can however be concluded with a fair degree of accuracy that

TABLE I

Assay of antigenicity of different batches of tetanus toxoid. Tests carried out at Kasauli

Batch number		Less than 0.1μ	0.1μ or more. Less than 1μ	¹ μ or more	10μ or more	Total tests
1984 J P 1384 E P 1382 D P 1380 F P 1386 A 565 113 65A 3437 2 F 1546 P 1386 A	(2.5 c.c.)	 5 1 0 7 . 6	2 4 3 2 3 1 0 4 3 2 3 3 3	9 6 7 7 3 4 2 1 	 0 1 	11 10 10 9 7 5 . 5 8 9 9

Tests carried out in England

Batch :	number	More Less	than than	$0.01\mu \ 0.1\mu$	More than 1μ Less than 10μ	. 10 units	More than 10 μ Less than 100 μ	Total tests
1382 1384 1385 790, 821 819 810			 i 		8 2 7 7 4 5 6	2 1 1 2 2 2 4	2 6 2 2 8 7 2	12 9 11 9 14 14 12

3 of the samples did not pass the prescribed test.

Immunization with half the prescribed dose, i.e. 2.5 c.c. in the case of one sample (P 1386 A), was found to produce the prescribed minimal amount of antibody.

Out of 81 guinea-pigs tested in England, only one had less than one unit of antitoxin. Out of the total number of 98 guinea-pigs tested at Kasauli, 49 had less than one unit in their circulation. If the guinea-pigs injected with these toxoids which did not pass the test are excluded, then 25 out of 74 guinea-pigs had less than one unit of antitoxin.

Out of twenty-four guinea-pigs injected with three different batches of toxoid (two of which were prepared in England and one in India), only two had 10 units or more of antibody in their sera, i.e. 8 per cent. Out of the 81 immunized guinea-pigs tested in England, 41 had 10 units or more of tetanus antitoxin, i.e. 50.6 per cent.

On the basis of the above-mentioned data, it is logical to conclude that the guinea-pigs immunized in England produce a higher titre of antitoxin as compared with the guinea-pigs bred in Kasauli. It is therefore not advisable to insist on the same test for standardization of tetanus toxoids as laid down for England.

Tubercle bacillus.—During the course of the researches carried out by the writer on tuber-culosis in Edinburgh, Paris and Calcutta, a

marked difference was observed in the susceptibility of guinea-pigs and rabbits in Calcutta as compared with those in Paris and Edinburgh. Some of the observations are recorded below:—

A suspension of tuberculous glands was injected intradermally in 0.5 c.c. amounts into two guinea-pigs, they were sacrificed 24 days after the injection. No lesions were demonstrable in the organs in one case, the other had only a solitary tubercle in the lungs.

The tuberculous tissues (glands + skin + lungs) of a guinea-pig were emulsified and injected into guinea-pigs and rabbits. The two guinea-pigs infected by the intravenous route were sacrificed after 8 weeks, one had only a few discrete tubercles in different organs, the other had extensive lesions. One of the rabbits injected intravenously with 1.0 c.c. of suspension was sacrificed after 8 weeks, no microscopic lesions were observed at all. The other rabbit was injected with 10 c.c. of the suspension subcutaneously and 1.0 c.c. intravenously. It was sacrificed after 26 days, there was an isolated tubercle in the lungs and only a minute abscess was seen at the site of the subcutaneous injection.

The lesions observed were on the whole much less extensive than those observed in tuberculous animals in Europe. The effect of the injection of stock cultures of human tubercle bacilli was next investigated.

Three guinea-pigs were injected intradermally 0.2 mg. each of the culture of human tubercle

bacillus. One guinea-pig sacrificed after 38 days had a well-marked ulcer at the site of injection, the corresponding glands were enlarged, there were no other lesions visible. The second guinea-pig was sacrificed after 67 days, there was only a minute local lesion, the lymph glands were normal in appearance. The third guinea-pig was killed after 51 days, there was a well-marked ulcer at the site of injection and the corresponding and sub-lumbar glands were enlarged. Although tubercles were present in liver, spleen and lungs, yet no bacilli could be seen in the smears of spleen and lungs. A few tubercle bacilli were observed microscopically in the liver and lymph glands.

The absence of extensive lesions in the infected animals was either due to the low virulence of the human tubercle bacilli or the laboratory animals in Calcutta were much more resistant than in Europe. In order to elucidate this problem, a highly virulent bovine strain (Dupray) was obtained from the Pasteur

Institute, Paris.

Eleven guinea-pigs were injected with different amounts of the bovine tubercle bacillus varying from 0.02 mg. to 30 mg. by the intradermal or hypodermic routes, the minimal amount used in the experiment was infective. The guinea-pigs were autopsied at different periods varying from 7 to 61 days. The guinea-pig examined 7 days after infection with 0.2 mg. had a well-marked ulcer, the lymph glands were enlarged. Only two guinea-pigs injected with 0.2 mg. showed involvement of internal organs, a few tubercles were present in the lungs only in one case, the other had more extensive lesions.

Four rabbits were injected with 10 mg. of the bovine culture, two intravenously and the other two intraperitoneally. They were autopsied at varying periods from 25 to 90 days. One rabbit did not show any microscopic lesion, the other two had tubercles in lungs and a few either in the spleen or kidney. Only one rabbit examined after 90 days had fairly extensive

lesions.

The lesions seen in Europe in hundreds of guinea-pigs and rabbits were definitely much more extensive It can be safely concluded that rabbits and guinea-pigs in Calcutta are, on the whole, much more resistant to tuberculosis than those in Paris and Edinburgh.

Summary

1. The guinea-pigs immunized in England with tetanus toxoid produce a higher titre of antitoxin as compared with the guinea-pigs bred in Kasauli. It is therefore not advisable to insist on the same test for standardization of tetanus toxoids as is laid down for England.

2. Rabbits and guinea-pigs bred and reared in India are much more resistant to tuberculosis than those in Europe, the injection of tubercular material into these animals for isolation and classification of tubercle bacilli into human and

bovine strains is not likely to give the same results as in Europe.

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A Mirror of Hospital Practice

A CASE OF CONGENITAL INGUINAL HERNIA WITH POLYORCHISM

By A. D. BHANDARI

Medical Officer Incharge, District Hospital, Bareilly, U. P.

KITAYATULLA, a Mohammedan male child aged 4 years, was admitted to the hospital on 28th February, 1947, with the history of swelling on the left scrotum—the swelling being noticed in the inguinal region since early infancy, later on increasing in size. The parents also stated that the child had been suffering from discomfort and occasional pain in the lower abdominal region.

On examination, the left scrotal sac was separated by a raphe which was pushed to the extreme right. The right side of the scrotum was empty. There was no cord on the right groin. A diagnosis of congenital inguinal hernia was made and the child was operated on 3rd March.

On opening the hernial sac (which was, of course, a vaginal variety), both the testes were found to be in it with separate vasa-deferentia and pampiniform plexuses for a short distance at the lower part—both these structures getting fused together to form a common spermatic cord about midway between the external and internal inguinal rings.

The scrotal pouch was a single one. There was also a median raphe in the scrotum. The testicles were so well defined and separated in the scrotum that one could not suspect them to have descended on the same side on physical examination.

Usual hernial repair was done and both the testicles replaced in the scrotum.

The child made an uneventful recovery and was discharged from the hospital on 18th March, 1947.

The above case is a very rare anomalous combination of congenital inguinal hernia (vaginal variety) with descent of both the testicles on the same side of the scrotum.

This case is very interesting for having two distinct and separate testicles, separate vasa-deferentia and pampiniform plexuses at the lower part and a common cord at the upper part, *i.e.* intra-abdominally.

My thanks are due to my colleague, Dr. Parmanand Khanduri, for his assistance.

AN UNUSUAL COMPLICATION FROM AN ELECTRIC SHOCK

By J. F. HENRIQUES, L.M. & S., F.C.P.S. Chief Medical Officer, Rajpipla State

THE following case is reported as the complication observed was rather unusual.

An electrical mechanic, when switching a light at the electric power house, got a shock. He instantly felt pain and a dragging sensation from the right side of the chest to the fingers of the right hand. But the chief and instant trouble was a severe pain in the perineum that set in and soon after he passed a small quantity of urine, which contained blood. While going home, he came to the hospital complaining of severe pain in the perineum. As he refused to stay in hospital, he was given a diuretic mixture and advised to report the next day. Next morning he turned up at the outdoor with a fairly large swelling at the perineum where he was complaining of the night before.

After admission into hospital, he was put on penicillin, diuretic mixture, and local application of ichthyol and antiphlogistine. On the 3rd day, though the quantity of urine passed in 24-hours was increased and the swelling decreased, the urine was still highly acid and tinged with blood. So he was put on an alkaline mixture, other treatments remaining the same. The symptoms gradually subsided and he was discharged cured after 12 days' stay in hospital.

There was no history of gonorrhea. As the accident occurred in the power house, he must have probably received a fairly high voltage shock, but there were no signs of burns on the fingers with which he touched the switch which gave him the shock.

TREATMENT OF BALANTIDIAL DYSENTERY WITH HYDRARG BINIODIDE

By S. PRAMANIK, M.B., D.T.M. (Cal.) Santipur, Navadwip District, West Bengal

BALANTIDIAL dysentery is a rare disease in man and its treatment up till now has not been very satisfactory. Napier advises large and dangerous doses of emetine hydrochloride grain 1 daily for 15 to 20 days, and methylene blue in 2-grain doses by mouth has been said to be used with success in some cases. The following case successfully treated with hydrarg biniodide might be of interest:—

A Hindu male, aged 40 years, came for treatment on 9th October, 1947, with the history of having had an attack of diarrhea 3 months previously. He had been passing 20 to 30 watery motions daily with mucus and had occasional attacks of colicky pain in the abdomen. Stool on examination was found to contain Balantidium coli and giardia cysts. He was put on injections

of emetine hydrochloride grain 1 daily, methylene blue grain 2 in capsules twice daily for one week and a course of quinacrine hydrochloride tablets, one tablet three times a day for 5 days. After an interval of 12 days the stool was again examined and found to contain numerous highlymotile Balantidium coli but the giardia cysts had all disappeared. The patient was now having 6 to 8 loose motions daily but his condition was far from satisfactory and I was thoroughly disappointed with the treatment given so far.

Following the more recent publication by Shun-Shin (1947) of a series of 10 cases of Balantidiasis in Rodriguez (a dependency about 350 miles from Mauritius) treated by parenteral administration of hydrarg biniodide in therapeutic doses and being struck by the brilliant results achieved by him, an intramuscular injection of 1/6 grain of hydrarg biniodide was immediately given and the patient was advised to report after four days. Stool was then examined and after a very careful search no Balantidium coli could be detected. In spite of negative findings in the stool he was further given another intramuscular injection of 1/6 grain of hydrarg biniodide. Stool was re-examined after 5 days. The balantidia were completely and permanently absent as before. The patient had been passing 2 to 3 normal and well-formed motions daily and said that he was feeling quite well.

REFERENCE

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MANIACAL SYMPTOMS IN ASCARIASIS

By C. V. KRISHNASWAMI, M.B., B.S. (Mad.).
D.O.M.S. (Lond.), F.R.C.S. (Edin.)
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A HINDU male, aged 57 years, with a history of fever of three days' duration, was brought to me one evening held between six men. They stated that, on the pyrexia slightly abating, the patient, who had been quiet in bed till then, began getting up and running about. Examination had to be done with the patient standing and held by the attendants and hence a thorough one was not possible. He was all the time trying to pull himself out of the grip of the attendants and was making the sound of spitting with his lips, though actually no fluid came out. Pupils were normal, heart and lungs showed no abnormality and the abdomen was slightly indrawn. It was not possible to examine other systems. There was a history of obstinate constipation.

The patient was tied down to the bed and ½ grain of morphia, obtainable only at 10 p.m., was administered hypodermically. He lay quietly asleep till the early hours of the morning. He then began tugging at the bonds and muttering in a low voice. Towards mid-day he vomited a full-grown round-worm. As

and the tendency to spit out continued bulky doses could not be given, drop doses of croton oil, one that evening and the other next morning, were given. These had no effect and were followed by 4 ounces of alba mixture. This also failed to produce any result and was followed by 2 santonin powders containing calomel grain 1 each and a second dose of 4 ounces of alba mixture. A large evacuation occurred containing 9 round-worms twisted round one another into a tight ball. evidently was the cause of the obstruction in the bowel. The delirium and tendency to escape from his bonds gradually wore off and with a few further purgings 4 more worms were passed. Towards the 5th day of the illness the patient showed symptoms of a commencing pneumonia which responded readily to the first 4 tablets of M.&B. 693. On the 12th day the patient was discharged cured and walked home normally.

Though round-worms are known to cause convulsions and similar nerve symptoms in children, I believe, maniacal symptoms, as noticed in this case, have not been mentioned in the literature.

Therapeutic Notes

NOTES ON SOME REMEDIES

XVI.—ARSENICALS IN NON-SYPHILITIC DISEASES

By R. N. CHAUDHURI, M.B. (Cal.), M.R.C.P. (Edin.). T.B.B. (Wales)

Professor of Tropical Medicine, School of Tropical Medicine, Calcutta

- 1. Anthrax.—Anti-anthrax serum is an effective remedy in this condition, but when this is not available, full doses of NAB should be administered and repeated in a day or two if there is no response as shown by abatement of the local ædema. Arsenic may also be given as supplementary to serum, indeed such a combination appears to give better results and is desirable in severe cases, especially those affecting face and neck. The local lesion which must not be dealt with surgically should be immobilized by sandbags or splints. It may be mentioned that sulphonamides (vide I.M.G., 82, 26, 77 and 131) and penicillin are also effective in anthrax.
- 2. Relapsing fever.—NAB causes a rapid disappearance of the organisms from the blood, but it should be given at the beginning of an attack when the temperature is on the rise, and not near the time of crisis when the temperature is coming down, or just following it, as the patient may collapse as a result of Herxheimer reaction. Two or three injections at short intervals might be necessary if the temperature does not promptly come down
- does not promptly come down.
 3. Rat-bite fever.—The disease due: to
 Spirillum minus usually responds dramatically

to a few injections of NAB given at short intervals, but it has not proved of any value in the form due to *Streptobacillus moniliformis*. On the other hand, penicillin is very effective in both types.

4. Trypanosomiasis.—In this disease the following drugs are used: Bayer 205 or British equivalent, Suramin (B.P.), a complex preparation of urea; Tryparsamide; Pentamidine (M.&B. 800); and occasionally antimony salts like tartar emetic and anthiomaline.

In the early stages treatment with suramin may be sufficient. It is given intravenously, 1 gm. being dissolved in 10 c.c. distilled water and injected slowly into a vein. It is repeated at weekly intervals up to a total amount of 10 gm. Tryparsamide is especially useful in the late stage when the nervous system is involved. The initial dose is 1 gm. in 10 c.c. water, and it is gradually increased to 3 gm., injected twice weekly until a total of 24 gm. has been administered. Like suramin, pentamidine is good for early cases, the dose being 100 mg. in 10 c.c. of water injected into a vein daily for 12 days. With it treatment is completed in a very short time, but as yet there is not sufficient experience with the drug.

Trypanosomes readily become drug-fast to tryparsamide, but less so to suramin or antimony compounds. Hence relapses occur when much better results are obtained by combined therapy than by continuing the same drug in larger doses. A preliminary course of 5 gm. of suramin is given, followed by tryparsamide as detailed above. Antimony sometimes makes a useful combination with suramin, but its chief indication is in cases complicated by bilharziasis (for use of pentamidine and antimony salts, see I.M.G., 82, p. 542).

There is no effective remedy for American trypanosomiasis (Chagas' disease).

5. Yaws.—The best treatment is a combination of arsenic and bismuth. A course of 12 weekly injections—NAB alternating with a bismuth salt, e.g. bismuth subsalicylate—is considered suitable, but improvement is so rapid that very few patients care to complete the treatment. Where intravenous injections are not possible acetarsol for one week or carbarsone for ten days may be given and is repeated after a short interval.

Penicillin is also very effective in yaws.

- 6. Vincents' angina.—At one time thought to be a specific remedy (used parenterally as well as locally). NAB has now given place to more potent drugs, viz, sulphonamides (vide I.M.G., 82, 26, 77 and 131) and penicillin.
- 7. Tropical eosinophilia.—This is a recently recognized clinical entity characterized by marked eosinophilia and lung symptoms responding to arsenic. Common symptoms are cough and wheezing, worse at night, which may be accompanied by asthmatic dyspnæa, lassitude, fever and loss of weight. X-ray of the chest often

shows diffuse mottling in the lung fields. The ætiology is not known for certain. The response to arsenic suggests a parasitic origin and some workers incriminated tyroglyphid mites as the cause, but their results have not been confirmed. For treatment, six to ten injections of acetylarsan (3 c.c.) intramuscularly or neoarsphenamine in doses of 0.15 gm., 0.3 gm., and then doses of 0.45 gm. intravenously are given at intervals of three or four days. Where injections are not possible acetarsol or carbarsone may be given by mouth for about 10 days and is repeated after an interval. Treatment by arsenic sometimes brings about at first an increase of the eosinophilic count and/or the symptoms but is subsequently followed by reduction and restoration to health. Blood count should be checked repeatedly during the course of treatment and injections stopped when the eosinophils reach below 1,000 per c.mm. The writer reported a case of this syndrome in which during treatment with acetylarsan a serious condition of granulocytopenia with faucial inflammation developed. Urine should be examined but slight albuminuria is no contra-indication to arsenic administration. Recovery is usually complete, but sometimes recurrence occur. The writer also encountered a case failing to respond to a full course of treatment, but recovered completely after a change of climate.

- 8. Amæbic dysentery.—See I.M.G., 82, 209, and 276.
- 9. Giardiasis.—Giardia intestinalis is a protozoan parasite and believed in a proportion of cases to be a pathogenic organism associated with a type of recurring diarrhea accompanied by abdominal distension. Mepacrine acts almost as a specific against the parasite (1 tablet of 0.1 gm. thrice daily for 5 days), but acetarsol has also been employed with success, the dosage being two 4-gr. tablets twice daily for one week. It is necessary to repeat courses of both drugs at intervals of 7 to 10 days as the parasite may be resistant to treatment.
- 10. Abacterial pyuria.—This is a chronic condition with symptoms of urinary frequency which are apt to recrudesce for no apparent reason. The urine contains pus cells but is invariably sterile. There may be history of urethritis, but more often this is of non-venereal origin. Sulphonamides and penicillin have no action. The treatment is by intravenous injection of NAB—0.45 gm. every fourth day. About four injections are sufficient.
- 11. Trichomonas vaginitis.—Trichomonas vaginalis, a protozoan, is a common cause of intractable leucorrhea. Clinically it is associated with a thin irritating discharge, often frothy and with a characteristic sour smell. There is secondary vulvitis and pruritus; sometimes bladder symptoms are present, suggesting urethritis and trigonitis. A hanging drop of vaginal secretion from the posterior fornix may

show the trichomonas under the microscope. Saline douches followed by the insertion of 2 to 4 tablets of acetarsol (special proprietary preparations are available in the market) high up into vaginal fornices twice daily give immediate relief. Gradually the insertion of the tablet is reduced in frequency until finally they are given on the days immediately following the menstrual period. A more thorough way is to use the acetarsol powder as an insufflation, allowing it to be deposited well in the fornices, but such can only be given by trained personnel. Insufflation is contra-indicated during pregnancy. Complete eradication of the organism is by no means easy and relapse is common. Treatment should be continued for a few weeks after apparent clinical cure.

- 12. Skin diseases.—(a) Lichen planus. is rather resistant to treatment, and at present it is usual to treat the itch with anti-pruritic lotions and give preparations of arsenic and mercury by mouth or bismuth by injection. X-rays have been employed with some success when the lesions are localized. (b) Psoriasis. The only internal remedy that seems to do any good is arsenic by mouth gradually increased to full doses and given with periodic rest intervals. It is of value in a chronic stationary case or in cases which are responding to local treatment satisfactorily. The latter consists in applying preparations of hydrarg ammoniata, chrysarobin, coal tar or resorcin, after first removing the scales from the patches. Arsenic is contraindicated in the acute stage of skin diseases.
- 13. Miscellaneous.—Liquor arsenicalis has been much used to reinforce the action of quinine in malaria especially in those chronic cases in which cachexia is present. It has also a reputation of lessening the relapses. In any case it does not appear to have any action on the parasites. The organic arsenicals, viz, NAB and mapharside, have some action on P. vivax, the fever being controlled quickly but no influence on relapses, and are not ordinarily recommended. In malignant malaria they have no action. Arsenic has long been used as a hæmatinic, but it is now known that it acts as a bone marrow depressant rather than a stimulant, and as such it is of value in chronic myeloid leukæmia givenby mouth in increasing doses until definite toxic symptoms, e.g. nausea, vomiting and diarrhea, appear. It is started again after a few days' rest, and in this way by carefully regulating the dose good palliative results are obtained. Hodgkin's disease sometimes responds to it by the temporary recession of the glands, but the ultimate course of the disease is not affected. Arsenic is an old favourite for chorea and disseminated sclerosis, but such use is only empirical. It is also very commonly employed for its 'tonic' properties in combination with iron and strychnine; the mixture probably acts by improving appetite and relieving weakness.

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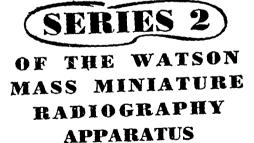
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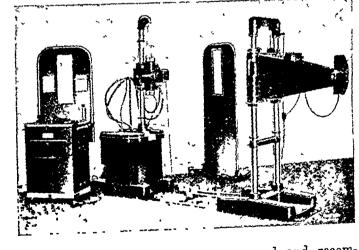
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* Report of the Committee on Tuberculosis in Wartime. Special Report Series 251. H.M. Stationery Office.

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Indian Medical Gazette

JANUARY

INCONGRUITIES IN TUBERCULOSIS AND ASSOCIATED CONSIDERATIONS

THE tale of tuberculosis opens like A Tale of Two Cities:—

'It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hopes, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way' (Dickens, 1859).

Public health and medical relief measures are reducing the incidence of tuberculosis.—This is the general belief. A statement made in a recent conference on tuberculosis is typical of this belief. 'Since the Welsh Association came into action, tuberculosis in Wales has been halved, in circumstances and under conditions which were none too favourable, and it was a reasonable expectation that given better facilities the scheme would further reduce tuberculosis in Wales to a very favourable low level' (Editorial, 1947a).

Public health and medical relief measures are not essential for the decrease in the incidence of tuberculosis.—'Without in any way minimizing the desirability of active public measures against tuberculosis, it may be pointed out that the decline in the tuberculosis death rate in this country set in long before the establishment of hospitals, sanatoria, or dispensaries for the treatment of patients suffering from the disease, indicating that the underlying social, economic and biological causes were able by themselves to effect a considerable reduction in the mortality from tuberculosis in the absence of any ad hoc public health interference' (Wilson and Miles, 1946). Italics are ours. This applies to England and Wales. The mortality has decreased steadily since 1851, from 3.638 per 1,000 persons living in 1938. Tuberculosis is a dying disease in Britain.

Increase of tuberculosis in war-ravaged Europe.—'As for tuberculosis, which is without doubt the most important infection in Europe to-day, mortality figures leave little doubt that it has increased in many places' (Editorial, 1947b). This statement is typical of what is being said in England and U.S.A.

No increase in tuberculosis in war-ravaged Europe.— In a report of the military governor,

U.S. zone, on public health and medical affairs, the death rate from tuberculosis in the U.S. zone is given as 6.7 per 10,000 in April 1946 and 6.6 in March 1947. Hence the mortality rates given by the International Red Cross Committee are 3 to 5 times the official figures; and whereas the committee's figures indicate an alarming doubling of the rate in a year, according to the official data no change has taken place (Hart, 1947). Italics are ours.

In war-ravaged but victorious England 'the fall in mortality rates continued during the war years 1939 to 1944.... The death rate in 1945 is the lowest so far recorded; this reflects the efficiency of preventive measures which have operated despite the hazard of five years of war' (Parkinson, 1947). The last clause of the quotation cannot be given much weight. The campaign against the dying dodo.need not have been so intensive.

In victorious and unravaged U.S.A. 'in spite of the rigors of war time, death rate from tuber-culosis was down to 40.1 per 100,000 population' (Hilleboe and Holm, 1947).

In neutral Spain there is an increase on the registers. This increase however 'does not arise from the spread of the disease by contagion, but from the fact that the methods for the detection of tuberculosis are more rapid' (International Red Cross Committee quoted by Hart, loc. cit.).

Tuberculosis may be leaving the European stock alone but it still takes its toll of the non-European races.—This superstition is almost a belief with certain philanthropes, highly placed personages and insufficiently occupied busy-bodies of means. It has even influenced the epidemiologist in England.

A recent report from the Sudan follows the line of argument advanced for Spain. 'The figures for tuberculosis in the Sudan indicate an apparent gradual increase but so many variable factors are at work such as increasing disease consciousness, more refined diagnosis, better notification, increasing urbanization and war experience that it is impossible to draw clear deduction from the figures' (Report for 1945 received in 1948). Such is the opinion of the workers on the spot.

As a matter of fact the factors involved are (i) overcrowding in slums and (ii) wages. The fact that the disease is more common in English sailors than in English soldiers has been known for some time and lends support to our explanation. Apart from these considerations, tuberculosis discriminates, if anything, in favour of the non-European races.

Tuberculosis has declined in the non-European population of New Zealand.—In many European as well as Maori houses only one case of tuberculosis was found in a house (Welch, 1947). If the Maoris were more susceptible they would have been wiped out by the overcrowding

imposed on them by western civilization. In fact they must be less susceptible.

Immunization with BCG. (1) Discouragement.—The position remains where it was. 'There is strong evidence that this method of immunization has now passed the stage of experiment. It is possible that it will have a place in future schemes for the prevention of tuberculosis but further trial investigations in this country are indicated '(Parkinson, loc. cit.).

(2) Encouragement.—'Indeed it would appear that BCG vaccine holds more promise for the reduction and control of tuberculosis than such a drug as streptomycin, even though the results of the latter in individual cases are impressive and spectacular' (Hilleboe and Holm, loc. cit.).

Immunization with the vole bacillus is faring no better.

Discouragement.—The (1) Streptomycin. American Council on Pharmacy and Chemistry after studying the effects of the antibiotic in Pulmonary, Genitourinary, Bone and Joint, Draining Cutaneous Sinuses and Lymphadenitis, Trachio Bronchial and Laryngeal, Alimentary Tract and Peritoneal, Pericardial Cutaneous and Ocular, Miliary and Meningeal, and Thoracic Surgery Conditions, conclude that 'the results permit but tentative conclusions in most cases' (Smith, 1947). 'Many patients are still under treatment. At least 1,200 more will be studied in the next twelve months. The position of streptomycin should be much clearer at the end of that time '. Further, they warn that 'its toxicity is not to be ignored'.

In reality the results of treatment in some conditions have been 'spectacular' (vide supra). The serious toxic complication after months of treatment appeared only in 6 per cent of cases. 'Sufficient loss of hearing developed in 9 cases (1.1 per cent) of the present series to make cessation of treatment seem wise to the investigator; with the cessation, hearing returned

towards normal'.

Annual Report of the Committee on Therapy Sub-Committee on Streptomycin (Revised Version, 1947) also states: 'Streptomycin, like many other useful drugs, has definite toxic potentialities. Some of these are unique and incompletely understood at the present time. The reactions tested must be kept in mind whenever streptomycin treatment is contemplated and compared with the hazard of the disease which is being treated'.

Another fear is the resistance of the germ of tuberculosis to the antibiotic. In this matter the discouragement, in keeping pace with the greater availability of the latter, has amounted almost to intimidation. 'Apart from risk to the patient of his tubercle bacılli becoming streptomycin-resistant, there is the wider public health danger of new cases arising in which the strain is primarily resistant—for example in infants infected by mothers treated with streptomycin' (Editorial, 1947c). The

new germs of tuberculosis, we are warned, may pipe out the human race as so many atom bombs.

(2) Encouragement.—'Streptomycin administered early in the course of tuberculous meningitis is capable of resisting the process' (Mehas and Truax, 1947). 'One of the most impressive results in the treatment of tuberculosis in man by streptomycin has been obtained following its use in draining tuberculous sinuses' (Brock, 1947).

Associated considerations: (1) A comparison with the situation in Spain.—In our opinion what, in the opinion of the International Red Cross Committee, applies to Spain applies to India also, in spite of the fears and threats of the health authorities, intensified by the aforesaid philanthropes, highly placed personages and insufficiently occupied busybodies of means. More tuberculosis is being detected by increase in the personnel and equipment of antituberculosis establishments. Further, most of the disease appears to be occurring centripetally, round foci of industry. A similar epidemiology was observed in Sweden during the last century (Wilson and Miles, loc. cit.). Greed brings to the slums of centres of industry country lads, some of whom cannot adjust themselves to the altered and difficult conditions of life. They sicken and die of any infection including tuberculosis. Once upon a time, during the extension of the East Indian Railway, they died of malaria in large numbers at Saharanpur.

The army figures show that Indians, unlike the Gurkhas, are not particularly susceptible to tuberculosis. The disease, in spite of the philanthropes, high personages, busybodies, and perhaps vested interests and cheap labour employed in its detection is not such a problem

as it is made out to be.

(2) Tuberculosis in cattle.—In spite of gaps in work it is common knowledge that Indian cattle in general and rural Indian cattle in particular are freer from tuberculosis than European cattle (Taylor, 1918; Indra Jit, 1946). Further, the disease when it occurs tends to remain mild, local and limited (Soparkar, 1925), suggesting a natural resistance. That is why 101 specimens of milk from tuber-. culin-positive animals were negative bacteriologically at Amritsar (Mallick, Aggarwal and Dua, 1942) and not a single case of bovine origin was found in 60 cases of surgical tuberculosis in Calcutta (Ukil, 1933). Further still, the earliest description of tuberculosis in animals is to be found in the Indian elephant (Iyer, quoted by Francis, 1947).

The source of infection of European cattle is traced to the disease in the Mediterranean

littoral (Francis, loc. cit.).

In cattle obviously, tuberculosis in India waned centuries ago. It is not likely to be waxing in humans now.

(It has been thought that the strain affecting elephants—if the disease was really tuberculosis -need not have been bovine: the human strain also affects elephants. Further, the possibility has been considered that the two strains might not yet have separated at that remote period in history, 2000 B.C. or earlier-Francis, loc. cit.).

- (3) Tuberculosis in laboratory animals.—This is definitely less aggressive than in the West. Indian rabbits and guinea-pigs resist local strains and also specially imported western strains much more than the western animals. The soil is inimical to the spread of the disease. An account appears elsewhere in this issue (Goyal, 1948, p. 35).
- feeding the industrial (4) Housing and worker.—That the incidence of tuberculosis can be checked and that the declared disease can be brought under control comparatively easily have been amply demonstrated by Papworth Settlement (Brieger, 1944; Parkinson, loc. cit.; Burn, 1947). Infected husbands and wives have bred children who have remained healthy.
- 'Of 151 children admitted in families with positive sputum, 37 presented no clinical or radiological evidence of tuberculosis; 101 showed evidence of past infection; 4 had juvenile tuberculosis and 9 developed pulmonary tuberculosis of the adult type (adult phthisis). All were ten years of age or over on admission to the settlement' (Macnalty, 1944).

'Of 108 children born in the village as many as 55 presented no clinical or radiological evidence of tuberculosis; 53 showed evidence of past infection. The findings of the years 1926, 1927, 1932 and 1933 already quoted are confirmed by additional years of experience. None of the village-born children (and more have now come of age) has, while a member of the community, contracted tuberculosis of the lungs, glands, bones or joints, or, indeed, in any known clinical form'. 'These are remarkable results'.

The infectivity of the germ is not of a high order. More often than not it spends almost a life of symbiosis in the host and then dies out. Given comfort, good food and freedom from worries of life, cases of tuberculosis can live and work and bring up healthy children almost like normal men and women.

(5) A change in the outlook of the toiling millions.-There is no harm in stating the unpleasant truth bluntly that in our country no public health measure will succeed unless the outlook of the masses on life changes. This is the work of the social reformer. The weekly address by the Mazdur Sabha on the radio from Calcutta is the only correct step in that direction. Let the address multiply for all communities in all callings. The country has become radioconscious and sound advice given in heart to heart talks will succeed. There is no reason why medical men should not give this advice, specially the country practitioners who are a part of the

We suggest that expenditure on social reforms will yield much better returns than the one on

sanitation, involving deputations to foreign countries and studies overseas. There is no lack of sanitation in our culture. This was recognized by some wide-visioned Westerners during the last 'There was a strong feeling in the meeting that the village life of India must not be too rudely disturbed, that the customs which are sanitarily harmless or even beneficial, such as the early morning resort to the field or bush, must not be interfered with even though they differ from those of Western nations' (London Letter, 1897). Insanitation comes into operation only when the villagers are herded together in industry in towns. The proverbial filth of the East begins and ends with bazars'. So does tuberculosis in non-European races.

Our national disease is the Diabetes of Wealth. As a diabetic hankers for carbohydrates so do the masses hanker for cash. It is obtained at any cost, retained for a while and then wasted on births, deaths and marriages. It does not raise the standard of living and passes through their fingers as sugar passes through the system of a diabetic. The responsibility for the cure of this disease lies entirely with the social reformer.

As the standard of living will rise the population pressure will fall, dignity of human labour will rise and sense of comfort and joy of living will find a place in the span of life. Men will not live in sheds like cattle, will eat good food which is now eaten only on births, deaths and marriages, and will appreciate, demand and enjoy leisure. The incidence of tuberculosis in foci of industry will then fall, as it has fallen elsewhere.

The converse also holds good. Unless the outlook of the masses changes no expenditure on public health measures in general and antituberculosis campaigns in particular will alter things materially.

Some measure of benefit, however, can be obtained even under the present state of affairs by providing the mill labourers in towns with their special countryside food, cheap vegetables and fruits, at cheap rates, by running special countryside food wagons on trains. A supply of countryside fuel will also be useful as such items of food have their own methods of prepara-The vast majority of seriously ill Indian soldiers, overseas or in cantonments distant from their villages, want to go home only to eat food cooked by their mothers or according to their mothers' technique. Alimentation remains the primary need of man and selective alimentation the primary joy of living of which are born strength, stamina and resistance to disease.

Immunization of the tuberculin-negative population, in the foci of industry particularly, will also help, as has been advocated elsewhere in this issue [Lal (1948), p. 53; Viswanathan (1948), p. 44].

A simple increase in wages will not be effective: The money will be hoarded and then

wasted.

- (6) Histoplasmosis.—Hardly any work has been done in Europe and Asia. The American work throws light on tuberculin negative and x-ray positive supposed cases of tuberculosis.
- (7) Against alarm.—'If when the tide is falling you take out water with two-penny pail, you and the moon together can do a great deal, (Hill, 1948). The disease is waning in its cycle, There is no justification for pessimism even with the exchange of populations and proposed expansion of industry in the country. An epidemic of tuberculosis in India will remain confined to the nightmares of the pessimistically inclined epidemiologist,

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INDEX FOR I.M.G. VOLUME 82 (1947)

THE index for volume 82 (1947) will be printed and included in the February 1948 issue. Subscribers are requested to detach it and bind it along with volume 82.

Special Article

London and

RECENT DEVELOPMENTS IN TUBER-CULOSIS CONTROL IN THE WEST AND THEIR APPLICATION TO INDIA

GOYAL, R. K. (1948) .. Indian Med. Gaz., 83, 35.

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Ltd.,

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Adviser in Tuberculosis, Government of India

THE following report is based on the observations made during my recent visit to eight European countries including the U.S.A. and on discussions which took place during four international conferences which I attended :-

Administration

In most of the western countries particularly America, voluntary organizations were solely responsible for initiating and administering antituberculosis schemes. Tuberculosis associations in these countries not only carried out educative propaganda work, but also established clinics and sanatoria. In Great Britain, however, local authorities in counties and boroughs have been responsible for tuberculosis control schemes. During recent years, the Ministry of Health and local authorities in the respective counties have begun to take over the functions recently performed which were until voluntary organizations.

The tuberculosis control division of the Public Health Services in the U.S.A. which was formed only in 1943 has taken over many of the functions of the National Tuberculosis Association of America. This division has a chief director, with a consultant for each of the eight districts into which the country is divided for the purpose of anti-tuberculosis measures. The consultant supervises the schemes in each State to see that they are up to requisite standard.

The allotment or otherwise of grants to respective States from Federal funds depends on the report submitted by the consultants. The division has also taken over the training of specialists and technicians, mass radiography of population groups, and research. In Norway and Sweden also, tuberculosis control divisions of the Ministry of Health have been formed with more or less the same purpose. Sweden has gone a step further in having a chief director for mass radiography in the whole country. He controls and directs all the mass radiography units working in different parts of the country.

Though the State is assuming more and more control of anti-tuberculosis schemes, it is however realized in these countries that voluntary organizations have an important part to play in tuberculosis control, particularly for conducting educative propaganda and organizing demonstrations of newer methods of control. They also help in spurring governmental machinery to activity, by persuasion and constructive criticism.

On the basis of what I saw and learnt about tuberculosis administration, I wish to make the following suggestions:—

- 1. The Tuberculosis Association of India should be helped in all possible ways in order to model it on the lines of the American National Tuberculosis Association. The central office of the American association has a whole-time medical secretary-general and a non-medical executive secretary. The establishment has over 100 members divided into different sections with sectional heads to deal with such subjects as, propaganda, Xmas seal, education, after-care and rehabilitation, etc. The association should entirely voluntary without any official control. It should be financed by donations, subscriptions and sale of seals and greeting telegrams. The American association is supported entirely by Xmas seal sales, whereas the Swedish association obtains its finance by the sale of greeting telegrams.
 - 2. The provincial and State associations should be strengthened and modelled in the same way.
 - 3. The tuberculosis association will work in co-ordination with the activities of the health authorities.
- 4. A tuberculosis control division of the Ministry of Health is to be formed with a director and regional consultants. At present it would be premature to have regional consultants as provincial tuberculosis schemes are in their infancy. The T.B. control division, at present, will act in an advisory capacity inducing the provinces and States to initiate proper antituberculosis schemes. As an immediate measure, it will concern itself with organization of training specialists and technicians and with setting up demonstration centres for such control methods as B.C.G. vaccination, mass miniature radiography and chemotherapeutic trials.

5. The Tuberculosis Association and the Tuberculosis Control Division will work independently under independent control but will establish close liaison and work in co-ordination.

Diagnostic

During recent years, particularly during war times, mass miniature radiography has come to the forefront in practically all the western countries. As large population groups can be examined in a short time, early cases without symptoms are being discovered in large numbers. As the percentage of cures and arrests of disease is greatest in the first stage of the disease, any method like mass miniature radiographic survey, which will discover the largest number of early cases, can be considered to be the sharpest single weapon in our anti-tuberculosis armamentarium. The mass miniature units which are now in use are of two types, stationary and mobile. Recently I saw in Denmark a mobile x-ray unit mounted in a van complete with generator, developing and radiographic compartments. A unit of this type will be very useful for rural areas in India. It will cost about one lac rupees.

The photographic outfit is undergoing modification from day to day. A recent innovation is the mirror camera, which enables shorter exposures and sharper pictures. I was told that this type would be universally adopted.

Different types of films also have been in use. Of the 4 inches by 7 inches, 35 mm. and 70 mm. films which are now in use, the last is likely to become the standard size.

Mass radiography has brought to the front two very important problems. One of them is the significance and appearance of shadows without symptoms and signs and the other is the disposal of early cases of tuberculosis without symptoms, the so-called minimal lesion. At the American Tuberculosis Conference, the second question was discussed. The discussion revealed sharp differences of opinion among experts. Dr. Amberson of New York was of the view that all these cases should be hospitalized, while Dr. Holm of Denmark thought that minimal lesion without symptoms needs no treatment except being kept under observation. The conference finally agreed to a via media, by which these cases would be under observation as out-patients for six weeks, and if by that period the lesions show the slightest sign of increased activity the patients would be immediately hospitalized and active treatment would be carried out.

For a place like Delhi, the unit can be located in the precincts of the Irwin Hospital. This would facilitate not only the examination of all patients and contacts attending the tuberculosis clinic, but also routine examinations of all patients attending the Irwin Hospital. Besides these, group examination of industrial workers, school children and staff of large offices can be conducted in the afternoons.

One argument can be put forward in favour of instituting mass miniature surveys even in the absence of efficient anti-tuberculosis schemes provided there are at least out-patient departments of general hospitals where the minimal cases can be periodically observed. If the whole population of a city is periodically examined by mass miniature, and if by that procedure, all the early cases are detected, and kept under observation, there will come a time when all the advanced cases would have been eliminated, by the natural process, and only early cases will be left behind, and as most of these cases get well with routine measure of observation and treatment, in well-conducted out-patient clinics, it will be possible even to eradicate tuberculosis in the course of time. Eradication and not mere control is the goal now aimed at in Scandinavian countries. experts there are of the opinion that mass miniature will help them to achieve that object.

// Preventive

(a) Clinics.—All the western countries have a large number of well-established and well-run clinics. In most of the places the clinics are only diagnostic and preventive centres. form of treatment is given there. In the Scandinavian countries the large cities like Copenhagen, Oslo, and Stockholm have each only one central dispensary. The dispensary, however, has several sections each of which deals with patients derived from a certain district of the city. The scheme of centralization will be neither feasible nor advisable in Indian cities which cannot boast of the same facilities of transport as are available in western countries. Moreover, owing to the ignorance of the masses in India, clinic facilities should be taken to the people and not the people to far-away clinics. A distance of a mile or two is enough to dissuade them from going to the clinic. So far as Indian cities are concerned, it is much better to have clinics located in different parts of the city rather than to have only one central clinic.

vaccination.—The question (b) B.C.G. B.C.G. vaccination has been agitating in my mind for some years and I was very glad to have had the recent opportunity to gather firsthand information not only in conferences but also from laboratories and workers in the field about its innocuousness and its efficiency. B.C.G. was the subject for discussion in three conferences which I attended, namely the Commonwealth Tuberculosis Conference, Conference of Tuberculosis Association of Great Britain and the International Physicians Conference. The discussion at the last conference was the most fruitful as experts with long personal experience of B.C.G. took part. Dr. Heinbeck from Norway, Professor Tytler from Wales, Professor Holm from Denmark and Professor Walgren from Stockholm were the prominent speakers. I had personal discussions with each of them individually after the conference. They were

all of opinion that as there was sufficient evidence to show that tuberculosis is assuming epidemic proportions in India, B.C.G. vaccination should be introduced without delay.

B.C.G. vaccination has been in vogue for nearly 20 years in France, Holland, Denmark, Norway and Sweden. Russia has been using B.C.G. during the last war years. Over one million people have been inoculated in Russia alone. In America and Canada field trials have been made among Red Indians. Mr. Aranson of Phips Institute has been vaccinating alternate Indians in the reserves of Arizona and Alaska for the last 11 years. He has extremely valuable statistics to show the efficiency of B.C.G. vaccination. As a result of his trials the Tuberculosis Control Division of the U.S.A. had decided to give B.C.G. an official trial.

B.C.G. was never used in Great Britain. Recently, however, the Ministry of Health have decided to give B.C.G. a controlled trial.

In my opinion B.C.G. vaccination has passed the stage of experimental trial. It can be initiated immediately provided the vaccine can be made available. The vaccine can be manufactured in this country provided a separate laboratory solely for this purpose is set up. The process is simple and does not require elaborate equipment. Only stringent measures should be adopted to prevent any type of contamination.

The main difficulty regarding importing of the vaccine from abroad is the vaccine has to be used within 6 to 9 days of its manufacture. Flying the vaccine is possible so far as the main cities in the air route are concerned provided efficient machinery is set up to utilize the vaccine without delay.

A method of conserving the potency of the vaccine for a long period by dehydration is being tried in Russia and America. Dr. Rosenthal, whom I met in Chicago, told me that he had succeeded in drying vaccine and that he would be in a position to supply the same without cost. He very kindly gave me a sample of the dry vaccine which I have brought with me.

Apart from the supply of vaccine, the question that has to be decided is on whom vaccination should be done. Should all people be vaccinated? No. The tuberculin positive people will derive no benefit by B.C.G. vaccination. Hence a tuberculin survey should be undertaken if mass B.C.G. vaccination is decided upon. In Denmark and Sweden, during group examination with mass miniature and tuberculin test, B.C.G. vaccination is done as a routine on all those who are tuberculin negative. As an initial step, I suggest that B.C.G. vaccination be given to all tuberculin negative contacts and tuberculin negative members of hospital staff.

Epidemiological studies

Dr. Lurie of the Phips Institute, Philadelphia, has been studying the factors that influence susceptibility to tuberculosis. He demonstrated to me the different types of tuberculosis which have

occurred in different species of rabbits after being infected with the same dose of tubercle bacilli and living under same environmental conditions. He is of opinion that different races react to tuberculosis infection differently. Susceptibility to disease and the type of disease developed are dependent on heredity and race. Though his views are questioned by others, his ability to produce the human type of chronic fibro-caseous tuberculosis in certain species of rabbits by a single infection is an argument in favour of the theory which has been gaining ground during recent years, about the pathogenesis of pulmonary tuberculosis, namely the adult type of tuberculosis is only a postprimary manifestation of a single infection and not due to second infection.

Dr. Seibert in the Institute, who was the discoverer of P.P.D., is now working on the biochemistry of the blood in tuberculosis. She has elaborated a complicated blood test for tuberculosis activity. If it is simplified and perfected, it will be a very valuable test for diagnosis and

prognosis.

Chemotherapy

Promin and sulphones have been given therapeutic trials for some years in tuberculosis. During recent years, streptomycin has been and is being given extensive trials in practically all the western countries. I had discussions with Professor Weisman, the discoverer of streptomycin, Dr. Hinshaw of the Mayo Clinic, who was the first to give it therapeutic trial in human beings, and Dr. Arcy Hart of the Medical Research Council who is controlling streptomycin trials in Great Britain. I also met the physicians who were concerned with clinical use of streptomycin in Scandinavian treatment, and studied their progress reports.

The dosage varies with the physicians using the drug. It varies from 1 to 3 gm. a day given parenterally. Owing to the large dose that is given, it produces occasionally some toxic symptoms in some patients. Four types of toxic reactions are said to have been observed: (1) histamine reaction characterized by flushing, headaches, and fall of blood pressure; (2) anaphylactic reactions; (3) vestibular disturbances and deafness; (4) irritation of the kidney. At present most physicians continue the treatment for 2 to 3 months. After six or eight weeks tubercle bacilli are found to develop

streptomycin resistance.

The problems of resistance to, and dosage of, streptomycin are subjects of experimental research in the Olive View Sanatorium in California. Dr. Bogen who is doing this work told me that in experimental tuberculosis they have succeeded in getting equally good results with smaller doses of streptomycin. If therapeutic trials with small doses prove successful, it would prove to be the most profitable piece of work, as cost of treatment will be considerably diminished. Moreover, toxic symptoms can be

avoided. Streptomycin has come to stay in the treatment of tuberculosis though only in a limited way. It has not been found to benefit the chronic fibro-caseous types. On the other hand definite improvement and in some cases definite cures have been effected in acute miliary tuberculosis and tuberculous meningitis. The allergic phase of adolescent phthisis appears to benefit by streptomycin.

So far as India is concerned, streptomycin should be made available to certain tuberculosis institutions, where the patient can be kept under careful observation. It should on no account be made available to general practitioners for the treatment of tuberculosis. Its extensive use should be postponed until the results of experi-

ments with small doses are confirmed.

P.A.S.—P.A.S. or para-amino-salicylic acid is under therapeutic trials in Sweden. It is absolutely non-toxic and is administered by mouth. The cost of the drug is, however, prohibitive. The administration of the drug causes

rapid disappearance of symptoms.

Sputum is reduced in quantity, temperature comes down, appetite improves and sedimentation rate falls. Unfortunately, as soon as the drug is withheld, all the symptoms recur. During recent months streptomycin, and P.A.S. combination is being given a trial. The combination of these two drugs appears to delay the development of streptomycin resistance in bacilli.

Surgical treatment measures

Both in England as well as in certain parts of U.S.A. pneumoperitoneum is being extensively used. In fact some physicians prefer P.P. to A.P. In their view, P.P. is much safer and has larger indications. Scandinavian countries are against P.P. Monaldi's operation for cavity drainage has not found favour in any of the countries I visited. Lobectomy for chronic localized tuberculosis is done by some surgeons both in England and U.S.A. Dr. Semb, whose operations I witnessed in Oslo, combines apicolysis with thoracoplasty. He said that he succeeds in closing all types of cavities in this way. In New York I met Dr. R. Klopstock who is of opinion that removal of the ribs from below upwards helped in better and earlier closure of apical cavities. He, it was, who performed the first tobectomy for pulmonary tuberculosis. The main indication for lobectomy is bronchial involvement.

Surgery of the chest

During recent years, more and more pneumonectomies are being performed for malignant growths. At the physicians' conference there was an extremely valuable symposium on surgical treatment of congenital heart disease. A good few surgeons both in America and Great Britain have done several operations on the heart,

Medical education and training in tuberculosis

Apart from studying the methods of tuber-culosis control in different countries, I visited several teaching institutions like the post-graduate medical school at Hamersmith, Guys Hospital Medical School, Brompton Hospital, Edinburgh Royal Infirmary, Uleval General Hospital, Oslo, Sankt Gotans Sjukhus, Stockholm, and John Hopkins Hospitals and School, Baltimore. I also discussed educational problems with the heads of institutions and departments like Professor Mac-Michal, Sir Francis Frazer, Dr. J. D. S. Cameron, General Sir Bannett Hence, and others.

So far as tuberculosis is concerned, there is no uniformity in the teaching methods or in the period of training. In most of the teaching institutions the under-graduates do not get any special lectures in tuberculosis. Nor do they attend any special institutions for clinical train-In Edinburgh, however, there is a professor of tuberculosis, who is responsible for training of under-graduates in tuberculosis. So far as post-graduate teaching is concerned, none of the universities in any of the western countries, except in Wales, have instituted a diploma or a course in tuberculosis. men become specialists in tuberculosis by working as residents in tuberculosis institutions. Tradew Society in America no doubt runs a course in tuberculosis for a period of 8 to 12 weeks. Those who attend the course, however, do not become specialists, on the basis of their They have to be residents in a attendance. hospital or sanatorium for a period of at least 2 years.

Teaching of medicine

As a teacher, I was interested in the modern methods of teaching. Didactic lectures have been brought to an irreducible minimum in most of the medical schools, both for undergraduates and post-graduates teaching. In some schools, particularly in Norway, there are no set lectures at all. Teaching is mostly done at the 'bedside and 'at the periodic clinical conferences. More emphasis is laid on the clinical and practical side of the work rather than on the theoretical aspects.

Another type of interesting experiment in medical education, which is being carried out in some of the medical schools in America, is the extra-curricular field training in which the student is attached to a private practitioner for a short period when he is expected to learn the elements of medical practice. I understand that the experiment has been very successful and students appreciate and like this part of their training.

Recommendations

Based on the knowledge and experience I have gained, through attending the various conferences and visiting medical institutions in eight of the western countries, I wish to make the follow-

ing suggestions regarding tuberculosis control in India:—

1. A tuberculosis Control Division of the Ministry of Health should be formed on the lines of T.C.D. of United States Public Health Service. The division for the present will confine its activities to advising the provinces and States regarding anti-tuberculosis schemes, to establishing training centres for B.C.G. vaccination, and to mass miniature radiography. It will also promote research and surveys.

2. A Tuberculosis Act might be framed on the lines of North Ireland Tuberculosis Authority which has only recently been put into form. It

will have to be suitably modified.

3. The Tuberculosis Association of India should be made into a completely democratic and voluntary body with no official or non-official government control. It should be strengthened in all ways. It should be modelled on the lines of the National Tuberculosis Association of America. Its activities will be mainly propaganda and education.

4. More beds for tuberculosis should be made available. Whereas most of the western countries have two to three beds for every death, India has only one bed for every 100 deaths.

5. As the disease is assuming epidemic proportions in many parts of the country, B.C.G. vaccination has definitely a place in any antituberculosis scheme that is adopted. The offer of W.H.O. to send a B.C.G. demonstration team might be accepted and Calcutta might be chosen as the centre. Two medical men and two technicians might be sent for training either to Serum Institute, Copenhagen, or Tice Laboratories, Chicago. I recommend Delhi to be the first centre where B.C.G. Laboratory might be set up.

6. Mass Miniature Radiography Unit might be installed in certain cities in India where nucleus of anti-tuberculosis scheme exists. Delhi is one of the places where mass radiography can be introduced straight away.

7. In order to expand and strengthen the praiseworthy activities of the Delhi University in the matter of post-graduate teaching in tuberculosis, its efforts to establish a department of tuberculosis might be supported by the Government.

8. Streptomycin might be made available for use in a few selected tuberculosis institutions. It should not be made available for indiscriminate use by general practitioners.

9. Under-graduate training in tuberculosis should be standardized. Twelve special lectures and six weeks, attendance in a tuberculosis clinic and six weeks in a tuberculosis hospital might be laid down as the standard requirement.

10. (a) Post-graduate courses in tuberculosis might be started in each of the large provinces. Delhi will be the centre for all the smaller provinces including the states. Delhi University Course which has already started should be considered the model for other centres to copy.

(b) Newly qualified medical men should not be sent abroad for specialization.

(c) No one should be sent to foreign countries

merely to take a diploma.

(d) Medical men of at least five years' standing with at least two years' experience in a tuberculosis institution might be sent abroad for a period varying from 6 to 12 months in order to specialize in- (1) surgery of the chest, (2) sanatorium treatment, (3) dispensary work or (4) tuberculosis administration.

(e) Senior members of tuberculosis services should be encouraged to go abroad particularly

to attend international conferences.

12. Influx of over 4 million refugees equal to the population of Denmark and concentration in crowded camps perhaps for months on end coupled with malnutrition, and exposure to inclemencies of the weather, will positively increase the incidence of tuberculosis which has already assumed epidemic proportions in many parts of the country. Hence it is imperative that neither the refugee problem nor any other type of financial liability should weigh against immediately implementing schemes for tuberculosis control in this country.

Medical News

NEW ANTIDOTE FOR METAL POISONING EFFECTIVE CURE FOR SKIN COMPLAINTS

By PERCY WALLACE

(Reprinted from F.1035, dated 15th October, 1947. Issued by the British Information Services, New Delhi)

An important drug, which will rank among the world's great medical discoveries, has been announced by the Medical Research Council of Britain. This drug is known as 'Bal'—British Anti-Lewisite. Its appearance means that arsenic can at last be fully exploited as a drug.

Doctors have known for years that arsenic kills some germs more efficiently than does any other substance. They knew it was of great value in treating chronic skin complaints and nervous diseases. But the use of arsenic has been limited by its own terrible effects on human tissues. The arrival of 'Bal' means that these

The Medical Research Council have reported striking successes on 44 cases of poisoning by arsenic. Thirty-one of them responded to the treatment in a remarkable way. (The Council's carefully-worded report goes so far as to describe the response as dramatic.)

Terrible effects

The discovery of 'Bal' began in the early years of the Second World War, when the most-feared chemical weapon was Lewisite. A drop of this colourless liquid on the skin can cause a terrible blister. Eyes splashed with it become permanently blind. Its vapour attacks

the lungs, causing pneumonia and often death.

British troops were issued with an ointment which could prevent blistering if quickly applied to the skin contaminated by Lewisite but could not save eyesight or halt the insidious internal effects of the gas.

The active principle of Lewisite is a reprise. Whet were

The active principle of Lewisite is arsenic. What was needed was an antidote with the power to neutralize its effects deep inside the tissues,

A research team was formed at the Oxford University Biochemistry Department, under the leadership of

Professor Peters. The team finally discovered a penetrating liquid which rapidly counteracted the effects of arsenic on the body. This liquid was called British Anti-Lewisite before it was named 'Bal'.

Curing heart diseases

Trials with human volunteers showed that 'Bal' prevents blistering completely if applied to the skin within an hour of contamination. It saves an eye splashed with Lewisite if given within 20 minutes.

To-day, two years later, 'Bal' is proving equally effective against poisoning by the salts of mercury, and is used in treating heart complaints and other disorders.

is used in treating heart complaints and other disorders. Of 26 patients with acute mercury poisoning, 25 recovered after 'Bal' injections. It is now being tested against the toxic effects of lead, zinc, gold and other metals.

'Bal', latest in the series of British medical discoveries that included M.&B. and penicillin, is now

to be mass-produced in Britain.

NEW CANCER TREATMENT

RADIO-PHOSPHORUS MAY REPLACE RADIUM

(Reprinted from F.1219, dated 16th December, 1947, British Information Service, Office of the U.K. High Commissioner in India, New Delhi)

Medical, research scientists working with the by-products of atomic energy in a Hampstead (London) laboratory have made important discoveries on the treatment of diseases.

One of the biggest is that cheap radio-phosphorus can take the place of radium (which costs £1,300 a gramme) and x-ray. Doctors can thus bring radio-active cures within the reach of thousands who could not otherwise afford them.

Some of the injections they are using are called 'tracer bullets' of medicine. Through instruments, doctors can watch those injections moving through the stricken points of the body.

RADIO-ISOTOPES

At the head of the Hampstead research group, working in close co-operation with atom scientists, is Dr. Arthur McFarlane, 45-year-old head of the Department of Biophysics at the laboratory. The new group of chemicals which Dr. McFarlane's team has discovered is called radio-isotopes. Some forms of cancer—particularly the thyroid type—have been successfully

Supplies of radio-active substances are being provided by the Atomic Research Station at Harwell. While all this is going on, it is emphasized that medical science is only on the fringe of a vast subject.—Daily

Graphic.

WILLIAM GIBSON RESEARCH SCHOLARSHIP

With reference to the above scholarship announced on p. 418, I.M.G., Vol. 82, July 1947, it is now understood that the Council of the Society has awarded the above scholarship to Dr. Alice Palmer of Sydney, Australia, for her proposed research on the circulation in pregnancy.

ROSS INSTITUTE OF TROPICAL HYGIENE

Dr. Alan Gilroy, obe. Mb., bs. (Melb.), dt. & H. (Eng.), who has arrived in India to succeed Dr. G. C. Ramsay as Principal of the India Branch of the Ross Institute, has proceeded to Assam where he will establish new headquarters of the Institute in India. From this centre, work on Industrial Hygiene will be co-ordinated and field research carried out on methods of malaria control as applied to industry

Dr. Gilroy had spent some years in North Bengal prior to being commissioned in the Indian Medical Service in 1941. He was posted to the West Africa Command where he was responsible for malaria control of the Nigerian section at the Trans-Continental Air Route. He designed and carried out an anti-malaria

scheme at Lagos, the capital, involving the drainage of

7 square miles of swamp.

1948 sees both the 50th anniversary of Ross's publication of his great discovery of the rôle of the mosquito in malaria and an expansion of the activities of the Institute that bears his name.

THE GENERAL PRACTITIONER'S MEDAL

Following the announcement by the Board of Trustees of the American Medical Association of the annual bestowal of a medal on a general practitioner for exceptional service to his community, a current comment in the J.A.M.A., Vol. 135, No. 5, 4th October, 1947, p. 290, states that the announcement has attracted the attention of the nation and that already many nominations have been made by women's clubs, rotary clubs and other community groups. It also reproduced the following editorial from the Providence R. I. Journal:

General Practitioner

News Item: On 7th January the American Medical Association will give a gold medal to a general practitioner selected from the country at large.

Dear Medical Association,

I been hoping you'd do something like this for over 35 years, and I'd like it to be our family doctor, who has been doctoring us ever since we thought the first

baby was a tumour.

You probably never heard of him. He's not one of your big men—never invented anything in a medical way except a little spool and darning needle gadget for removing ingrowing hairs, and the only time he got into your journal, he says, was the time he had a queer fever of his own. But I feel better the minute he comes into the house, for he doesn't come to see a lot of organs, he comes to see ME. He knows me—knows us all—inside and out, warts, scars, disposition, everything. He knows I can't eat tuna fish, that I get flighty with two degrees of fever, and overdo everything from mowing the lawn to drinking beer. And somehow he manages to add all these things up to make me feel like somebody. I don't believe I'd ever be an 'interesting case' to him no matter what I got. I'd just be me. That's really something these days.

I don't have to call on him often, but I'd be lost without him.

He's a grand all-round man, good story teller, good listener, good friend, a sort of father confessor with the aid of a stethoscope. It's unbelievable the good he's done in our neighbourhood. A lot of people owe him money. I'd certainly like to see him get the medal.

Yours sincerely, ALMOST ANYBODY.

THE IMMUNIZATION OF YOUNG CHILDREN AGAINST DIPHTHERIA

(Reproduced from J.A.M.A., Vol. 135, No. 6, 11th October, 1947, page 371)

In 1941 the Ministry of Health (England) launched a national campaign to immunize children against diphtheria before their first birth day. The slogan is: 'Diphtheria costs lives—immunization costs nothing'. The result has been a remarkable progressive fall in the number of cases and the number of deaths. Prewar figures averaged 58,000 cases and 2,800 deaths annually. In 1941 these figures had fallen to 50,707 and 2,641. In the following years the fall has steadily continued, until in 1946 the figures were only 18,284 and 472. The figures mean that for every 6 children who died from diphtheria before the war only 1 died in 1946 and that the number of cases has fallen by 40,000. Last year half a million children under 5 years of age were immunized. The aim this year is to immunize 590,000 babies before their first birthday. It is believed that such a high level of immunization has been achieved among children that diphtheria could be eliminated as an epidemic disease if in each year 3 of every 4 babies were protected before reaching their first birthday. The total number of children immunized since the campaign began is more than 6,600,000.

THE CARMICHAEL MEDICAL COLLEGE MAGAZINE

We have received copies of the September 1947 and the Reunion (December 1947) numbers of the above magazine. They contain a number of interesting articles by the staff and students. There is also an appeal for more funds to save the institution from financial difficulties encountered at present.

DR. C. STRICKLAND, M.A., M.D. (CANTAB.)

Dr. Cyril Strickland who worked in the School of Tropical Medicine, Calcutta, for 17 years from 1922 to 1939 and who was also for some time the Director of the School died in Jersey on 3rd November, 1947, at the age of sixty-six. He graduated with first class Honours from Caius College and was thereafter admitted to St. Bartholomew's Hospital for medical studies. Under Professor G. H. F. Nuttall he studied Protozoology and made the interesting discovery that the trypanosomes of rat are transmitted from rat to rat through the alimentary system by mastication and ingestion of the infected fleas. In Federated Malay States he worked on malaria control. In 1915 he made the important discovery of far-reaching importance that the clearing of jungles made in watercourses and pools in up hill areas were conducive to the breeding of the vector species of mosquitoes which require sunlight to thrive.

During the time he worked in Calcutta he concentrated his activities mostly to laboratory and field studies in malaria. After making extensive surveys of the tea gardens in Assam he put forth the theory of controlling the vector species, Anopheles minimus, by shading the breeding places. He published keys to the identification of adult and larval anophelines of India and the Far East and before he retired in 1939 his book on Deltaic Formation was published. In it the formation of deltas of the Ganges and the Brahmaputra rivers with special reference to malaria has been dealt with. After leaving the School he joined the army as a specialist in malaria and was employed in organ-

izing malaria work.

Dr. Strickland's death came as a great shock to his colleagues at the School of Tropical Medicine, Calcutta. They expressed their feelings at a condolence meeting held on 25th November, 1947.

INDIAN SCIENCE CONGRESS, 1948-49

(The following information is reproduced from Science and Culture, Vol. 13, No. 8, p. 338)

SIR K. S. Krishnan, Kt., d.sc., f.r.s., Director, National Physical Laboratory, New Delhi, has been elected General President of the Indian Science Congress Association for 1948-49 and the following have been elected as Sectional Presidents: Mathematics—Prof. S. Chowla (Delhi); Statistics—Dr. U. S. Nair (Trivandrum); Physics—Dr. R. S. Krishnan (Bangalore); Chemistry—Prof. P. B. Ganguly (Patna); Geology and Geography—Dr. C. Mahadevan (Waltair); Botany—Mr. M. S. Randhawa (Delhi); Zoology and Entomology—Dr. M. L. Roonwal (Benares); Anthropology and Archæology—Sri N. K. Bose (Calcutta); Medical and Veterinary Sciences—Dr. M. B. Soparkar (Bombay); Agricultural Sciences—Dr. R. S. Vasudeva (New Delhi); Physiology—Dr. B. B. Sarkar (Calcutta); Psychology—Mr. T. K. N. Menon (Baroda); Engincering and Metallurgy—Prof. M. Sen Gupta (Benares).

WAR ON TUBERCULOSIS. GOVERNMENT TO INTRODUCE B.C.G. VACCINATION

(From a leaflet issued by the Press Information Bureau, Government of India, dated 13-4-48)

In practically all the civilized communities of the world tuberculosis as a cause of death is undoubtedly the most important among the infectious diseases. Based on a few surveys it has been estimated that over 500,000 people die from tuberculosis every year in India. It is responsible, in addition, for an enormous

amount of prolonged disability, suffering and economic

The wide prevalence of the disease is shown by the fact that more than half the population, particularly in urban areas, becomes infected by the age of 20, and nearly all some time during life. Fortunately for us, however, only a small proportion of those who are infected develop the disease in a progressive or fatal form. It is also estimated that, in at least 80 per cent of patients, spontaneous healing occurs. The primary infection appears therefore to be able to stimulate the production of adequate protective power in the vast majority of people to a degree sufficient to enable them to e-cape further infection.

Ever since the discovery of the tubercle bacillus by Koch in 1882, research workers have been trying to evolve an effective method of artificial immunization. So far the most promising results have been produced through vaccination with an attenuated strain of the tubercle bacilli called B.C.G.

B.C.G. vaccination was first introduced in France by Calmette in 1921. Since then it has been used in an ever-increasing measure in most of the European countries, particularly in the Scandinavian countries. When Calmette advocated the administration of B.C.G. to new-born infants it was with no confidence that a strong and lasting immunity would result. He believed, however, that it would provide sufficient protection to nowever, that it would provide sufficient protection to save the child from contracting the disease during the first few years of life, when the chance of getting infected with tuberculosis is the highest. B.C.G. vaccination was particularly advocated for children exposed to severe natural infection from parents or relatives suffering from the disease and it was among such classes that the most successful results have been claimed in France. claimed in France.

The harmlessness of B.C.G. has been established beyond doubt by its practical application on a scale exceeded only by a few proved methods of immunization such as those for smallpox, diphtheria and enteric fever. A considerable measure of protection has been demonstrated for this form of vaccination against tuberculosis by the reliable data which have accumulated in the countries concerned, particularly those from Norway and Sweden. Though Calmette gave the duration of immunity following B.C.G. vaccination as of the order of 2 to 4 years, recent studies from Norway and Sweden suggest that the immunity might

last for 5 to 6 years or even more.

Plan of attack

The Ministry of Health in the Government of India, after careful consideration of the question in all its aspects, has come to the conclusion that mass vaccination with B.C.G. constitutes a potent and speedy method of bringing under control the high incidence of tuberculosis which has been spreading rapidly through the country. It is recognized that other measures directed towards improving the standard of life of the people and isolating infective patients are also essential for developing a comprehensive plan of attack. But B.C.G. has its own definite place in the campaign against the disease in order to achieve demonstrable results in its control within a relatively short time. It has therefore been decided to introduce B.C.G. vaccination, in the first instance, on a limited scale under the strict supervision and control of the Central Government.

World Health Organization sending Team

The World Health Organization have very kindly agreed to send a B.C.G. Demonstration Team to India by about the end of May 1948. The object of the visit is not only to popularize B.C.G. vaccination but also to show to the authorities concerned the process of manufacture of the vaccine and the technique of administration. The B.C.G. Laboratory will be located at the King Institute of Preventive Medicine, Guindy, while the field operations will in the first instance be while the field operations will in the first instance be carried out near Madanapalle under the supervision of the authorities of the Union Mission Sanatorium and later extended to our areas.

The World Health Organization Team is expected to work in India for a period of four months. In order to continue and expand the work initiated by the team, the Government of India have selected an experienced bacteriologist and a stechnician and propose to enced pacteriologist and a steening and propose to give them special training in the manufacture of the vaccine at Copenhagen. As it is extremely important to maintain a uniform standard of potency and efficiency and to prevent all possible chances of contamination with the virulent organization of the disease, it is proposed to confine the production of the vaccine to the Guindy Institute at present and to extend it later to one or two were centers. In the countries it later to one or two more centres. In the countries where B.C.G. vaccination has been carried out on a large scale, Government control over the production and distribution of the vaccine and of its administration to the people is being strictly enforced. In India also these conditions will be fulfilled in order to ensure that the vaccination campaign is developed on sound

CULATION AGAINST CHOLERA A VACCINATION AGAINST SMALLPOX INOCULATION

INFORMATION has been received by the Director-General of Health Services that, (1) travellers by all routes from India to the Persian Gulf Ports (Arab Coast) should be in possession of valid international certificates of inoculation against cholera and of vaccination against smallpox; (2) all passengers from India who enter Iraq by air and sea must, with immediate offset he in possession of double anti-cholera immediate effect, be in possession of double anti-cholera inoculation certificates in the international form, such certificates being not less than six days and not more than three months old at the time of the passenger's arrival in Iraq. Passengers by air will in addition be interned in Iraqi quarantine stations for a period of

six days, for three consecutive examinations of refuse.

Passengers passing in transit will however be exempt from the sanitary restrictions indicated above if they do not leave the airport.

INTERNATIONAL SOCIETY OF HÆMATOLOGY

THE International Society of Hamatology will hold its bi-annual meeting at the Hotel Statler, in Buffalo, New York, 23rd to 26th August, 1948.

Time has been tentatively allotted for symposia and presentations as follows: 1 day on general subjects, including radio-active and stable isotopes in hæmaincluding radio-active and stable isotopes in hæmatology, ½ day for problems and diseases related to the red cells, ½ day for problems and diseases related to white cells, 1 day for immuno-hæmatology, Rh-Hr (CDE-cde) antigen and antibodies, and hæmolytic anæmias, ½ day for coagulation problems and hæmorrhagic diseases and ½ day for business meeting.

Scientific exhibits will be presented in the south wing of the 17th Floor of Hotel Statler. Applications for the presentation of scientific exhibits are now being received by Dr. O. P. Jones, Department of Anatomy, University of Buffalo, Buffalo, New York. Chairman of the Programme Committee is Dr. Ernest Witebsky, Buffalo General Hospital, Buffalo, New York.

of the Programme Committee is Dr. Ernest Witebsky, Buffalo General Hospital, Buffalo, New York.
Dr. Eduardo Uribe Guerola, Leibnitz 212, Nueva Colonia Anzurez, Mexico, D.F., is in charge of the programme from South and Central America and Sir Lionel Whitby, University of Cambridge, Cambridge, England, is in charge of arrangements for the programme from Europe. Communications concerning applications for the programme will be received by the above-named committee men. above-named committee men.

All scientific sessions and exhibits will be open to scientists interested in hæmatology. This will, of course, include members of the medical profession and those branches of science dealing with hæmatology, such as biochemistry, biophysics, genetics, immunology,

Communications and applications concerning membership from India will be received by Dr. C. R. Das Gupta (Hæmatology Dept., School of Tropical Medicine, Calcutta), a member of the membership committee.

Public Health Section

TYPHUS IN BOMBAY

PART II: EPIDEMIOLOGY

By S. R. SAVOOR D. W. SOMAN and

N. S. VAHIA

(An Enquiry under the Indian Research Fund Association, Haffkine Institute, Parel, Bombay)

Incidence of typhus in the city.—The Executive Health Officer of the Bombay Municipal Corporation records 46 and 15 cases of typhus for the two years 1944 and 1945. Our own findings are 93" and 110 for the same period. Obviously all the cases had not been notified to the Executive Health Officer. As endemic typhus has many clinical features resembling the enteric group of diseases and as laboratory aid is not sought in all cases of continued fevers, and, further, as the practitioner is less familiar with typhus than with enteric, it is probable that many cases of the former are clinically mistaken for the latter and notified as such. It is obvious, therefore, that the number of cases of typhus is larger than is indicated by the health records. The samples of sera sent to the Haffkine Institute show that the ratio between the enteric and typhus cases is 4.6:1. no reason why the relative incidence of these two diseases in the city should be different from that of the laboratory. As the Executive Health Officer records 1,008 and 1,327 cases of enteric for 1944 and 1945, it is probable that the incidence of typhus is between 200 to 250 cases

The above estimate is on the conservative side. On one occasion when the authors went to see a case of typhus in a hospital, three other cases in the same ward, in which the disease had not been suspected, were diagnosed by the rapid bedside slide diagnosis, which was later confirmed

by the regular Weil-Felix reaction.

Distribution of typhus in the city.—In our series typhus occurred throughout the city which confirms the observation of Patel (1940). The districts of Lal Baug and Parel had the greatest incidence. These are the areas where the cotton mills of the city are concentrated. The rodent population that is attracted by the cotton seeds to these areas can be imagined. The mill areas are the slum spots of Bombay. The dwellings

are not rat-proof and in sanitation leave much room for improvement.

Race, age, and sex.—No race or religion was exempt. Cases occurred amongst the Europeans, Jews and Parsees as amongst Hindus, Moslems and Christians. There were six males to one female in the hospital series of 70 cases. This would give an exaggerated higher incidence in the male. This may in part be attributed to the reluctance of females to seek hospital treat-

Out of the 70 cases, thirty-eight, or more than half, were amongst individuals between 21 to 30. and 17 between 31 to 40 years of age. That is to say that nearly 78 per cent of the cases were amongst adult working population. There was only one case in a child who was 9 years old. It is well known that epidemic typhus is a mild disease amongst infants and children. May it be that the typhus in Bombay, which is a mild disease amongst adults, is milder still in children and therefore not easily recognizable clinically?

Vector.—The seventy hospital cases were carefully observed. There was no instance in which the body-louse was seen. In its personal hygiene the population is clean. The daily bath is taken as a ritual; and the weather even in winter necessitates only light wearingapparel. These factors may account for the absence of the body-louse. Three of the 10 females showed the presence of head-lice. But the head-louse plays little rôle in the epidemiology of typhus.

It is unlikely, therefore, that louse-borne epidemic typhus can break out in Bombay. Evidence indicating that typhus in Bombay is of murine origin and that it is probably carried by the rat-flea is given in part III of this paper.

Social status.—The hospital cases came from the indigent and lower middle-class people. Many cases, however, were diagnosed scrolfrom specimens sent by private practitioners, and it is thus not unlikely that the disease occurred in all strata of society.

Occupation .- Out of the 70 cases, 23 had no fixed occupation, 13 of the remaining 47 had been employed in hotels and eating establish-9 were mill-hands. The rest had miscellaneous vocations such as clerks, tramway drivers or shopkeepers. The high incidence of 28 per cent amongst individuals engaged in the food trade is significant.

Seasonal incidence.—The table given below records the monthly incidence of the disease in 2 years.

*For eleven months, from February to December

										,—		
Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	TOTAL
23	24 '	- 23	21	28	29	14	6	8	11	13	12	212

It will be seen that typhus occurred throughout the year, and that its incidence was greater in the first six months than in the latter half of the year. There was a sudden fall in the incidence in July, with a low rate of occurrence in August and September. This finding is not without significance. The monsoon season commences towards the third week of June and lasts till the end of September. The flooding of ratburrows and flushing of sewers probably bring down the rat-flea population, which in turn brings down the incidence of the disease in man.

The two hundred and twelve cases distributed over a period of two years are hardly sufficient to correlate with the meteorological data of mean temperature and humidity (mean temperature and humidity are important factors in the

multiplication of rat-fleas).

Isolation of a typhus strain from rats.—Six attempts were made to isolate strains from the brains and spleens of rats trapped in a house in which a case of typhus had occurred. One attempt succeeded. An account is given in the third part of this paper.

Summary

Typhus occurred in both sexes in all strata of society, in all the districts of Bombay throughout the year. There was a sudden fall in the incidence in July with a low rate in August and September. This was probably related to the monsoon rains which flush out rat-burrows and drains and reduce the rat-flea population. There was a significantly high incidence in those engaged in the food trade. 78 per cent of the cases were amongst the adults of working age between 20 to 40 years. The body-louse was not seen in any of the 70 cases. One strain of typhus was isolated from rats indicating that the rat is the reservoir of the disease in Bombay.

Thanks are given to the Executive Health Officer of the Bombay Municipal Corporation for the help given in the epidemiological investigation.

REFERENCE

PATEL, P. T. (1940) .. Report of the City Fever Hospital. Ann. Rep. Executive Health Officer, Bombay Municipal Corporation, 1939, 2, 56. Municipal Printing Press, Bombay.

A NOTE ON SOME PUBLIC HEALTH **ASPECTS OF TUBERCULOSIS***

By R. B. LAL, M.B., B.S., D.P.H., D.T.M. & H., D.B., T.N.I. Professor of Epidemiology, All-India Institute of Hygiene and Public Health, Calcutta

In our fight against tuberculosis, as also against other diseases, it is necessary to keep abreast of the means and methods adopted in

other countries but at the same time we must not lose sight of our special circumstances which are particularly important in a social disease like tuberculosis. As a natural endeavour, we have, so far, no plan in operation and in fact the only plan we have before us for consideration is the one placed before the third session of this conference by Dr. Benjamin (1945), according to which development might take place through clearly defined stages. This is a comprehensive scheme and I presume that the recommendations of the Bhore Committee are founded on it. It is, therefore, meet and proper that we may begin with a careful examination of this scheme. To refresh your memory, I might briefly outline the plan. Dr. Benjamin bases his scheme on a minimum pulmonary tuberculosis death rate of 200 per 100,000 in urban areas and 100 per 100,000 in rural areas. It is not clear how these figures have been arrived at. From our limited experience in Bengal, the proportion between rural and urban specific death rates suggested here would appear to be too high. This is a matter of considerable importance in determining our anti-tuberculosis

policy.

Dr. Benjamin expects five cases for each death, half of which, he believes, would be sputum positive and, therefore, presumably infectious. The ratio of cases to deaths is admittedly on the low side and it is probable that a larger proportion of infectious cases would be discovered if modern methods of pulmonary and gastric lavage were used and careful examinations of fæces were made. This again is a matter of considerable interest to the epidemiologist as also to the administrator. Though not satisfied with it, Dr. Benjamin would, for practical consideration, accept one bed per death and he would provide one Tuberculosis Clinic per 50,000 urban and 100,000 rural population, some of the latter being itinerant. In admitting cases to hospitals and sanatoria, preference would be given to infectious cases who could not be isolated at home and who would be dangerous to others. His scheme would take 30 years to mature fully but he would divide it into shortterm five-year plans which would serve as stages for the complete development of the scheme. He rightly emphasizes that in working out the details preference will be given to industrial and other urban areas where the disease is most prevalent and where conditions for its transmission are most favourable. The capital cost, according to the plan, would be one anna per annum per head of population and the recurring expenditure would amount to Re. 1-6 per capita. These estimates are, of course, liable to variation with fluctuation in prices and would probably be

higher at the present time. It is not my intention to go into the details as regards the administrative aspects of the plan but I shall confine my discussion to the epidemiological principles involved in it and to

the modifications, if any, required.

^{*}Presented before the fifth session of the Tuberculosis Workers' Conference held in Madras on the 20th to 231d January, 1948.

You will agree that as a public health problem, tuberculosis, like any other disease, is a sociobiological phenomenon. Now what does that mean? It means that the general laws known to sociological and biological sciences will be applicable to this problem and if any contradictions or paradoxes were observed they should provoke more intense research which would probably resolve these inconsistencies, but of course they must not be ignored if we fail to bring our observations in line with the general laws, in which case the laws themselves may need modifications.

Biologically, tuberculosis in man or animal is a host-parasite relationship of a deep nature and socially it is intimately involved with economic conditions and ways of life. The latter part does not call for much comment except that it emphasizes the need of careful consideration of local conditions, in successfully dealing with the problem and gives warning against faithful copying programmes which have found successful elsewhere. speaking, as is generally accepted, our late entry into the industrial field has brought about socio-economic circumstances whereby evolutionary cycle of tuberculosis is, at present, in its epidemic phase and with industrial advancement we are likely to go through more severe and widespread infection and disease in the near future and it will take many many years before the decline sets in. This will obviously increase the disease rate and specific mortality, and add indefinitely to the demand for hospitals and clinics. I don't know if we must necessarily accept this defeatist viewpoint and should not try and interfere with the undesirable course of events with new weapons which science provides or human ingenuity could and should develop. Be that as it may, we know that most epidemic diseases are liable to cyclic changes for reasons other than sociological which for the time being may not be fully understood and therefore our programme should take note of the experience of the highly industrialized countries and should make the necessary provisions. Besides the epidemiological structure of our community being so different from those of the countries just referred to, we must be very careful copying their methods and their programmes. We must remember that we are out to treat the community and not the disease, a principle which is being increasingly recognized in clinical medicine so far as individuals are concerned. The community is much more than a mere abstract conception of collection of individuals, for it has a history, a tradition, a location, besides the special biological, racial, cultural, organizational, economic and social characteristics of its all of which have profound constituents. influence on the quantum of infection and its concentration on herd resistance and on transmission of the disease.

Reverting to the biological aspects of the problem, it may be stated that the epidemiol-

ogist's interest does not centre round the patients alone. To him the uninfected non-immune, the infected non-infectious, the infected infectious and the recovered immunes as well as their circulation in the community are of equal importance. Luckily we possess technical means of learning a great deal more about the epidemiological structure of a community with regard to tuberculosis than in respect to many other endemic diseases, though there is lack of unanimity in interpretation of certain observation.

Unlike acute diseases the host-parasite relationship in this case is very intimate because the organism is of low-grade virulence. Though potentially mischievous, as a rule it does not worry the host, so long as the latter remains strong and healthy. The tubercle bacillus is like a sly artful associate who would normally give no offence and would, therefore, be tolerated, in fact, whose presence would remain unnoticed until such time as the host comes upon bad days. Before that happens the organism establishes such a firm hold on the host that it is extremely difficult to dissolve the unwanted relationship. What is true for individual host is also true for the group, as is evident from the high incidence of infection in most communities. In this connection, one may point out, that for ecological reasons, it is extremely difficult to root out infection from a community even in acute diseases and that it would be specially so for infection of the nature of tubercle bacillus. Non-appearance of overt cases for a pretty long time should not be interpreted as extinction of infection from the community, for, overt cases may occur without importation of infection when the epidemiological factors become favourable.

I think enough has been said to suggest that in dealing with a disease specially one like tuberculosis, in which non-specific resistance to disease is ordinarily of a high order, two principles emerge, namely—

(a) Attempts made to eradicate the sources of

infection are not likely to succeed, and

(b) Building up of reserve of non-specific and, if possible, of specific resistance, is likely to be well rewarded.

Social circumstances of the great mass of people and of the country as a whole also militate against eradication of infection. I believe, unless social conditions radically change, it is not likely that infection rate would be materially lowered, even when the scheme outlined above is fully operative. Dealing with the question of institutional isolation of infectious cases, Marcio Bueno (1947) observes thus: 'If in a rich country, such as the U.S.A., Herman Hilleboe, the Medical Director, Chief of the Tuberculosis Control Division, speaks about the tremendous investments of hospitalization, it will not be hard to understand that in Brazil it would be almost impossible to hold an adequate number of beds'. The tuberculosis death rate in Brazil is 250 per 100,000 which is not very

different from the conservative estimate of Dr. Benjamin for this country, so what is true of Brazil is also true of India at the present time. Besides like Brazil we are in the epidemic phase, and unless something revolutionary happens, we shall be faced with a growing number of infectious cases in the near future. Knowing as we do the existing home conditions, it needs no imagination to see that the increase in population, the trend of urbanization, the large influx of refugees and the acute shortage of building material would greatly accentuate the already difficult position regarding domiciliary isolation. However, the recommendations of the Bhore Committee that local bodies should build suitable homes in which tuberculous families that are unable to isolate patients in their overcrowded homes may be lodged, is commendable and one would wish that the resources of the municipalities would permit such a scheme. Besides, all that is possible should be done to educate the patients to behave in a manner which minimize transmission of infection to others. As shown in the Tyneside Inquiry (Bradbury, 1933), collective action can deal with the disease at the sources, whereas the ability of the individual to protect himself against it was more limited, which fact points to the value of organized and suitable public education in the subject.

In view of what has been said, it would be obvious that any scheme based on clinics, hospitals, and sanatoria should receive support, not on the score of public health, but on the legitimate grounds of giving relief to suffering humanity. Such minor advantages to community health as may accrue from it should be considered as merely incidental. How much money and government endeavour should be allotted for this purpose depends upon the overall picture of the resources and of social and other

requirements of the country.

It now remains for us to consider the question of upgrading specific and non-specific resistance. In his classical investigations, Bradbury (1933) found at Jarrow the following causal factors in order of significance: poverty, overcrowding, large families, under-nourishment, Irish race, diet, young mother, bad ventilation, insanitation, children in family, tenements and children not at clinic, and damp. Most probably very different relative values for the various factors would be found in different parts of this country. In fact, there would be found some entirely new causal factors, operating in various localities. These and their relative values can only be determined by surveys. These surveys would be useful and justifiable only, if they are designed as integrated social surveys with the object of working out diagnosis of the community as a whole on rational basis, which is to be followed by appropriate treatment as outlined in Scientific Aspects of Village Uplift (Lal, 1947). That, to my mind, is the quickest and the surest way to raise the standard of living of the masses whether in villages, factories, mines or in any other organized group. However, it is obvious that for achieving a rise in non-specific resistance, we have to await a general rise in the standard of living unless as an interim arrangement our resource would permit of embarking on the social allowances system with special privileges for the tuberculous families, after the manner of British Columbia (Southerland, 1947). Such a proposition could hardly be considered seriously at this stage of development of the national resources and the tuberculosis situation of the country.

Thus so far as urban population is concerned both from the epidemiological and sociological considerations the only hope would appear to lie along raising specific resistance by mass immunization provided it is effective and feasible. I agree with Marcio Bueno when he says that 'our greatest problem is to protect the healthy people' because, amongst other reasons, 'this measure would be economical and therefore for us more practical'. Brazil has gone ahead with B.C.G. vaccination and so also have Sweden, Norway and Denmark. In Latin-American countries alone, over 600,000 people have been vaccinated and in some parts of Denmark nearly 50 per cent of the population have been thus protected (Birkhaug, 1947). The final conclusion reached by the delegates from 20 Latin-American countries to the Sixth Congress of the Latin-American Union of the Societies of Tuberculosis, which was held in Havana, Cuba, exactly three years ago, reads thus: 'It has been demonstrated universally that it is possible to obtain immunization against tuberculosis, both in experimental medicine and in the human clinic, and it has also been proved that B.C.G. vaccination is harmless beneficial, therefore, the ULAST recommends wider use of the vaccine in healthy non-allergic people from the first day of life by mouth or by inoculation. In order to obtain the most favourable results, the vaccination should be made under the best conditions—absence of tuberculosis infection in the person vaccinated and prevention, as much as possible, of virulent infection in the period following vaccinations'. On the other hand Wilson (1947)*, in a paper at the International Conference of Physicians on 12th September last year, after reviewing the reports in support of B.C.G. mass vaccination, expresses doubt as to its value, in comparison, with other measures, under conditions existing in England and Wales. We are not concerned with his arguments which relate to the special circumstances of that country, for example, when he says, 'since the risk of dying from tuberculosis in the first year of life is so small that universal vaccination of infants is clearly out of

^{*}Reference may also be made to the Editorial in the same issue of B.M.J. and to Prof. Tytler's letter in correspondence column of B.M.J., 24th January, 1948, page 173.

the question, and vaccination, if it is used, should be restricted to specially exposed groups, like nurses, medical students, and children in tuberculous families? Possibly the degree of exposure to which most of our urban population is constantly subjected is comparable to his specially exposed group.

Actually a large number of factors should come in for consideration in the assessment of acquired resistance due to a given immunizing agent, but strict fulfilment of logical requirements cannot be attained in human communities. I will briefly discuss some of the important enterior in this connection.

criteria in this connection.

1. The proposed measure should be theoretic-

ally sound.

(a) The value of acquired resistance varies greatly in different diseases. As we have already observed, the host ordinarily possesses high degree of non-specific resistance against tuberculosis and there is reason to believe that induced specific resistance could build up adequate defence. This point was demonstrated as far back as 1924 by Heimbeck and later confirmed by Tornell and others, for resistance acquired naturally through subclinical infection, as demonstrated indirectly by tuberculin reaction, in a population constantly exposed to heavy infection. Could B.C.G. inoculation, which seeks to substitute avirulent organism for the virulent one, accomplish the same even when the exposure is continuous and heavy? If so B.C.G. mass vaccination would be an effective weapon in our hands.

(b) There should be adequate quantitative evidence as to the benefit accruing, if the proposed measure is adapted. A number of admirable and comprehensive studies extending over many years have been carried out which definitely point towards the beneficial results of B.C.G. vaccination. Wilson, who still remains unconvinced, has reviewed them critically and it would be simpler to examine his objections than to review the original reports. The opening words in his address read as follows: 'Vaccination with B.C.G. is now so universally applauded that any attempt to question its value is regarded almost as heresy', but he elected to

act as Devil's advocate.

His main objection is lack of proper control in the investigations. This is the greatest stumbling block in the way of assessment of resistance when dealing with human populations, because a proper control stipulates identical circumstances in the control and the experimental groups in all material respects, a condition which is very hard to fulfil. Thus Wallgren's (quoted by Birkhaug, 1947) studies at Gothenburg in which 92 per cent fall in specific mortality was obtained amongst the inoculated group of infants as compared with the rate prevailing amongst the infants a year earlier, are objected to on the ground that the former were removed from their infected mothers for a yariable time which in some cases extended to

one year and because the educational work of the dispensary nurses must have stimulated interest of the mothers resulting in shielding infants from infection. In support of the argument that such adventitious factor as the intelligent co-operation of the mother introduces an important fallacy, he refers to the famous York City investigation, reported by Levine and Sackett (quoted by Birkhaug, 1947, and by Wilson, 1947) wherein it was found that while the B.C.G. inoculated group showed five times advantage in mortality over the control group, the difference practically disappeared when this factor was eliminated. However, it should be noted that in this investigation the children were not separated from infected families and it might be that infection had already occurred before vaccination or immediately after vaccination before the development of resistance. This circumstance along with others, which need not be mentioned here, might offer at least a partial explanation of why no significant difference between the vaccinated and non-vaccinated groups was seen in certain

stages of this inquiry.

In the Chicago investigation by Rosenthal et al., in which the infants were separated and the controls were satisfactory, the results in favour of the inoculated group are described by Wilson as impressive. Certain items of information, most of them unimportant, are lacking in the report, and this prevents Wilson from accepting the conclusions fully. It is, however, not clear why he did not obtain the necessary details before publicly commenting on this most thorough inquiry. Nor, I think, he is justified in unceremoniously rejecting the suggestive results of Ferguson in Canada simply because the latter compares the vaccinated group with the previous five years' experience of similarly exposed persons, even though strict logic may be on his side. It would appear that Wilson has no valid objections to offer against the results presented by Heimbeck regarding the protection afforded by B.C.G. vaccination. Lastly, he is unable to find any faults in the admirably controlled study of Arnson and Palmer (quoted by Birkhaug, 1947) amongst North American Indian children in which the B.C.G. vaccinated group had sevenfold advantage over the control group, and he has entered upon speculation in suggesting that B.C.G. inoculated may not be attended with the same beneficial results in a civilized community with a different tuberculosis history. specially the everything together, experience of the Scandinavian and the South American countries, I feel sure there would be general agreement about the efficacy of B.C.G. specially when it is possible to isolate the vaccinated persons from sources of infection till such time, probably two months, as resistance develops.

(c) In a quantitative appraisal each event should be independent of the other. In other words one case should not influence the occurrence

of another case or one death of another death. From the very nature of things, this criterion is impossible of fulfilment in communicable diseases of human subjects, for we live in aggregates and if complete isolation could be affected, the problem would not arise at all.

(d) The probability of occurrence and nonoccurrence of the event should not be too small. Even with a rate of 200 deaths per 100,000 persons the probability of dying is fairly small. In western countries where most of the work has been carried out, it is smaller still. Here again we cannot hope to fully satisfy the logical criterion for assessment of resistance.

(c) The samples on which investigations are reasonably large be made should representative. This criterion is satisfied in most well-conducted investigations and thus spurious conclusions are avoided. The studies referred to above satisfy this criterion.

(f) There are other relatively minor points which have to be considered in this connection, which I feel satisfied have been adequately taken care of in the American investigations.

The measure proposed should give adequate return for the money, as compared with other This can only be learnt from actual measures. experience but being the most promising measure available under the social and epidemiological circumstances of this country there is every justification for putting it into practice on a large scale.

3. It should be practicable. Mass B.C.G. vaccination has been found practicable in Brazil and other countries similarly situated as our own, so there appears to be no reason why we should not be able to overcome such technical and administrative difficulties as may be met with in the course of mass immunization in urban areas where tuberculosis presents the

greatest problem.

Considering everything I suggest that a committee should be appointed, not so much to discuss whether B.C.G. vaccination on a mass scale should or should not be introduced in suitable areas, but to work out the details of how it may be done. This is a matter of great urgency because our non-specific resistance is, in all probability, at a very low ebb at the present time, due to aftermath of war such as scarcity of food and large aggregation of unsalted population and to the large-scale transference of population under condition of greatest stress. One shudders to think of the tremendous deterioration in tuberculosis situation which might result from social upheavals and which might put a very heavy burden on the State, if urgent steps are not taken to prevent the rapid flow of progressive primary cases and of secondary infections which will break down.

Having discussed the question of protecting non-infected persons and of preventing progressive primary infections, the question of tuberculosis reactors, who form a large proportion of the urban communities and who are

found in considerable numbers in rural areas, still remains.

It would be a matter of the greatest interest. to find out whether B.C.G. produces a form of allergy which may be less harmful in cases of secondary infection with virulent organism than that produced by natural subclinical infection. There is some suggestive evidence to point in this direction, but it is by no means adequate.

Another problem which I may venture to pose is, whether it was possible to obtain some fraction from the virulent organism or from B.C.G. which by suitable application may help to desensitize the tuberculin factors, without in any way diminishing resistance. Though difficult, theoretically it should not be impossible to discover such a substance. How far this procedure may prove efficacious or practicable is another matter, but the special features of pathology of tuberculosis strongly indicate the necessity of such an investigation.

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of the movements that emerge into consciousness. In this instance the enormously complicated follow-through of the whole body, with its complete readjustment of posture, 'flows in' automatically. And when we think about it this becomes less paradoxical than it seems at first. For absolutely every skill has its immensely complex embryological basis, the first 40 weeks of which in the vast majority of human performers has proceeded with strikingly little direction from the enteroceptive senses. During this early period all the major fundamental phenomena of posture are achieved. It is customary to regard them as coming to centre about and grow out of the three main types of postural reflex—the attitudinal, the righting, and the statokinetic. But these have none of the fixity and individualization which the later reflexes, dominated by external stimuli and the play of the special senses, show. They appear, disappear, and reappear. Though their pattern remains reasonably constant the ancillary movements which stream out from them change in order, direction, and number as they start now from one position and now from another.

Yet the structure which is later going to dominate all this machinery of the motor and muscular systems, as everybody knows, appears remarkably early and long before it can have much effective use. When the time comes for senses like the eyes and ears and for the central nervous system to play the leading parts in development—for learning proper to take the place of maturation—they have an immense and complex

substratum of movement to play with.

So it is not as surprising as might be supposed that one of the very common features of diminishing skill is an increased awareness of what the whole body is doing. We found that the air pilot, fresh and keen, follows his instruments and their signals closely and lets all his bodily equipment, so to speak, do as it likes. When impulses from the body do 'rise into consciousness', as the common phrase puts it, they are interpreted in terms of the machine as in steep turns and banks, in rapid acceleration, in climb and dive. But as he gets tired and his skill tends to break up, the messages from the body become, in their own right, insistent and oppressive. He is cramped, too hot, or too cold; there is pressure here and there; sometimes it seems that the instruments cannot possibly be right.

The really important upshot of all this is that every skill has its key features. They differ from case to case and from body to body, but they are always there. In by far the great majority of what may be called 'educated skills' they consist in operations of the distance senses and of central selection and judgment. If we can find them and discover how they are related to their unconsidered setting or scheme of posture and ancillary movement, the problem of how to measure skill has become simpler. It is the key features whose course must be plotted, whose efficiency must be recorded. In these last few years this has been done, or partly done, for many tasks: for the pilot in the air, for the tracking of targets, for the radar operator, for a number of skills which alternate periods of monotony with periods of intense activity, for the high-speed reading of dials and banks of dials, for the sending and reception of messages in code, for steady winding with varying load. In all these—and the same is true for innumerable other activities for which similar methods can now be developed—it is not every descriptive item in a repertoire of skill that must be recorded and assessed, but the leading functions only.

When, with this in mind, we stand back and look at

When, with this in mind, we stand back and look at skill as it is done, we can perhaps see clearly how it is that the skilled performer must know more what to do than how to do it, and that at once leads us to our third problem, the functions of 'the task'.

Relation of Achievement to Means of Achievement
The best approach is to consider an actual problem.
I will choose one which, in this field, is fairly simple—
the operation of the bomb-aimer. For practical reasons
this operation has been submitted to a very thorough
experimental study. The area bomber approaching his

target can see that its limits are marked by a number of flares of given colour which act as target indicators. His task is to judge as accurately as he can their central point of impact and to drop his bombs as near this as possible. Obviously the limits of area cannot for certain be exactly indicated, and the flare pattern can never for certain be exactly repeated. The number and clustering of the target indicators are liable to rapid and wide fluctuation. Sometimes a pattern will be relatively symmetrical, and sometimes there will be outlier flares which are known to constitute a kind of key item in the display and to distract judgment. Now it is possible to reproduce this situation in miniature, so that the flare patterns appear at the rate and with the visual properties which they have under operational conditions, and the bomb-release-control movements are the same. Naturally much of the excitement of the operational task is lacking, but a few experiments showed that this makes little difference. The errors produced in the experimental setting were almost the same, in direction and amount, as those made in operational conditions.

In the experiment the bomb-aimer is briefed so that he knows the general character of the area which is to be delimited. He watches the target indicator pattern approach, and presses the bomb-release switch at what he judges to be the correct moment. Two points are all important: first, he must precisely understand what he has to do—that is, to drop his bomb as near as possible to the central point of impact of the flare pattern—and, secondly, having performed his job, he must know the exact degree of his success. The common belief that 'practice makes perfect' is not true. It is practice the results of which are known that makes perfect. There is some evidence, though it is not quite conclusive, that the more the results can be expressed positively in terms of success

the better.

Under these conditions a normal operator will improve very rapidly and maintain his improvement from trial to trial. Now suppose we take a set of entirely new target indicator patterns, so that, given a constant fixation point, the retinal areas stimulated are different ones; and suppose we demand a new type of bombrelease pressure, so that the tactile areas and the muscles used are different. Provided these two things remain constant—the task and the knowledge of how successfully it has been performed—and there is no very marked change in the general environment, the skill which has been acquired remains with no increased time requirement and no greater fluctuation of success within a wide range. Ask the operator how he has done his work, and different persons may invent, or at any rate describe, very differing techniques. The plain fact is that most of them do not know and do not need to know, for the precise sensations and movements develop out of the setting of the task much as the specific arm or leg movements grow out of the attitudinal reflex; and they are fixed by knowledge of success as the very early movements must be fixed by some kind of biological efficacy, and with a similar but even wider range of variability.

Now, I think, we have assembled all the chief items required for the experimental measurement of those forms of skill which combine bodily and mental behaviour. First it is necessary to have some direct measure of achievement. This may, however, throw no light on the means of achievement. Since we must know not only how well a thing is done but within what limits of success it can continue to be done, a measure of immediate: achievement is not enough. Continuance of skill depends chiefly upon the maintenance of key features, both in receptor and in effector response, and on their time relations. These key features may vary from person to person or from group to group, but in many cases they remain remarkably constant for all, and always they display great constancy from effort, to effort in the same operators or operator groups.

or operator groups.

'Receptor key items can usually be determined experimentally by the design of the display or stimulus

pattern. The important factors are positional, directional, intensive, qualitative—as in the cases of colour, form, clustering, or pattern qualities—and numerical. It must be admitted that at present the determination of effector key items demands much the same process as clinical diagnosis, and perhaps it always will; for, as we have seen, the exact movements made in skilled performance are apt to escape any known form of exact objective registration. When key features are determined the kind of measure that is needed is a plot of their course, of the way in which and the degree to which they appear and reappear in continued exercise.

Finally, since all skill can be rightly treated as a continued interlinkage of receptor and effector responses, and the efficiency of this depends most of all upon timing, the third measure that is required is one of what I have called 'total reaction time' in a series. The measurement of achievement tells us nothing for certain about means; the plot of key items by itself gives us no information about the efficiency with which the task is done; the record of timing by itself does not indicate what are the key features or what success attends the effort. All three are needed

Is it possible to simplify still more, to find a single measure which will indicate what may be called the 'level' of skill in a given individual? The answer is 'yes', but the simplification may be more apparent than real.

The best single measure of skill level is one of its 'range of constancy', its degree of resistance to disintegrating conditions. This measure can be expressed in any one of the three basic ways. But a record of degree of achievement alone can obviously be extremely misleading: for with interference conditions a less successful achievement must be equated with a better one. Apart from a very prolonged experiment it is not possible to know how to do this, and at the best it can be done only in a very approximate and statistical manner. A plot showing how key features are maintained is better, but is rarely satisfactory alone, because it is not uncommon to find the operator switching from one set of key features to another, holding these for a while and then switching back again. And, since continued exercise may itself be a disintegrating condition, this may well be one of the best ways of maintaining a level of skill. A random fluctuation of key features is, however, always a sign of the imminent break-up of skill. If level of skill is defined by its capacity to resist interference, the measure of total timing of successive responses is the best single criterion, for if timing gets out of step nothing can for long stop the complete break-up of the skill. A combination of all three types of measure, however, remains the best criterion that can be used.

Is the Exercise of Skill a Discontinuous Function?

I want now to turn to a brief and, I am afraid, very incomplete consideration of a fundamental question about the nature of operative skill which is raised by all these investigations. At the very beginning I suggested that skill emerges with the graded response, when the characters, and especially the intensive characters, of the stimulus are faithfully reflected in the response. But how are we to picture this grading? It has long been evident that from an afferent sensory point of view there is no such thing as an absolutely continuous grading of response, but rather a series of steps which, set end to end, so to speak, produce an appearance of continuity. Moreover, these steps are affected by a large number of conditions, among which very important ones are, in some cases, the rate of application of the stimulus, and the state of adaptation of the peripheral organs. Within limits the faster the rate of application the more durable and the more within the range of adaptation the stimulus, the smaller the steps.

Similarly the effector side of the process may have a discontinuous character. In positional tracking, for example, an operator may appear to move continuously from his starting-point on to the target, and then, when it is stationary, or moving at a regular rate in the same direction, hold it continuously. But experimental records show that the normal thing for the operator to do is to produce a series of oscillations each lasting very consistently for about one-quarter to two-fifths of a second. With other forms of control the oscillations have a somewhat longer duration but are even more marked.

Other illustrations are better known. For example, in scanning a visual field for the identification of an inconspicuous object the observer will consider that he is making a smooth continuous exploration. But it is very easy to demonstrate that he proceeds in a series of saccadic eye movements with interfixations. The pattern of movements and pauses varies considerably from individual to individual, but remains very consistent for any particular observer. The mean fixation time, in free search for short periods, is approximately half a second with a mean interfixation interval of 5°.*

These facts and many others appear to suggest strongly that human skill is basically a discontinuous function both on the receptor and on the effector sides. But about the extremely important questions which arise if this is the case very little is known. How the discontinuity of reception is related to that of action is obscure, but each must clearly affect the other in continued exercise. Moreover, once a skill has been practised a few times the picture is complicated by anticipation and some factor very like inertia which may well tend to counteract any initial discontinuity.

Meanwhile it does seem as if we have to consider the human being as fundamentally operating somewhat after the manner of the ballistic galvanometer. For each skill there may be some minimal effector impulse which, once it comes into operation, prevents any further exteroceptive change from doing anything at all until the effect of the impulse and recovery from the effect are complete. If so this may be why timing and variations of timing are the central significant measures for all kinds of bodily skill. It would also follow that if ever a mathematic adequately descriptive of human skill becomes possible, it will be a mathematic of discontinuous functions.

MENTAL SKILL

Last of all I must say something about those highly developed forms of skill which are called mental. The most impressive characteristic of mental skill is its use of symbols, and particularly of symbols which can be given a permanent form. The distance senses upon which psycho-physical skill mainly depend set man free from the confines of immediate space. The symbols and their means of preservation which he has developed make possible enormous strides further in the same direction. They mean that timing, the vital feature up to this point, becomes of little direct importance or takes new forms. Now for the first time a new type of correction becomes possible, before the skill product need be given any public expression, actual or possible. In verbal skill it may be a substitution of word or phrase; in plastic skill of form, colour, mass; in music of tone, melody, with the items substituted picked out here and there and not in any settled serial order.

We are forced to use new vaguer criteria, of rhythm and proportion (which are no doubt still forms of timing), of meaning, relevance, truth, beauty, fitness. These appear to be almost infinitely fluctuating. Are they perhaps only approximations—so far to be placed in no known scale of quantities—to human conventions widely but impermanently established, or are they measurable by the nearness of their approach to something fixed and final? We can only speculate.

There is one suggestion which I believe could be studied with reasonable control. It occurs in the deeply interesting book by Jacques Hadamard called The

^{*}The experiments referred to were designed and carried out by Mr. R. C. Oldfield.

Psychology of Invention in the Mathematical Field.* In this book he refers several times to the appearance of error in mathematical reasoning: 'Good mathematicians when they make errors, which is not infrequently, soon perceive and correct them. As for me (and mine is the case of many mathematicians), I make many more of them than my students do; only I always correct them so that no trace of them remains in the

'Time will have its revenges.' Here perhaps it comes back on us in a new form. Maybe the best single measure of mental skill lies in the speed, with which errors are detected and thrown out, a function which becomes possible only when skill has first a symbolic

expression.

How is this done? We do not yet know, but we can set to work to find out, and if we do one thing is certain: we shall find that when man achieves the symbol and its permanent expression he does not really cut himself adrift from the age-long ways of the simpler kinds of skill. The topic replaces the task. Given the topic the words or numbers, or colours or tones, develop out of it as movements from the task. Both have their tremendous embryology, so that in both cases there is no necessary prior recall of items before use. Generally what we style recall is used.

There is a very simple and rather beautiful experiment which Henry Head used that may, I think, give us a clue. Before certain of his aphasic patients he set a number of solid shapes of triangles, squares, cubes, and the like, which were to be viewed but not touched. The objects were covered and then either exactly similar or different ones were placed in the touched. The objects were covered and then either exactly similar or different ones were placed in the hands of the patient behind the patient's back, and he had to indicate whether the object now being tactually explored had or had not previously been among those seen. No patients had any difficulty in making the required identifications accurately, but the order of original exposure could not be indicated without difficulty and error. The identification of form was immediate and required no necessary prior recall of the visual qualities concerned One sensory pattern of the visual qualities concerned One sensory pattern -tactual-fitted another sensory pattern-visual-of different mode. Head called this process 'matching'. It could cope with shape, but order requires the use of a symbol of the word-type, and was out of the range of his particular observers.

Now it has frequently seemed to me that matching, the immediate fitting of one set of responses to another the immediate fitting of one set of responses to another or of one content to another, may well be a process which has a much wider range than is often realized. For every task, for every topic, at every level of psychological development there are perhaps the fit reactions and expressions, and there is perhaps some mechanism characteristic of each level of development which can identify the ones that are fitting or throw out the ones that are unfitting.

I think, perhaps that what Hadamard suggests in

I think, perhaps, that what Hadamard suggests in the case of the good mathematician is just as true of the great clinical physician. It is not that he makes fewer mistakes than less-skilled people, but that he knows his mistakes more quickly and does not follow them so often to the stage at which they become irremediable. After, sometimes long after, it may become possible to identify and quite definitely to characterize the item of error. But at the time there is literally nothing except the knowledge that to go on along this line will not fit. The several patterns and functions involved must be very different from those of direct sensorial matching, and the content used may require a highly abstract and symbolic representation, but fundamentally the process is the same at the high level as at the lower.

And, of course, if this is a right way of approach. the case of the good mathematician is just as true

same at the high level as at the lower.

And, of course, if this is a right way of approach, mental skill, even in its highest reach, is not merely an approximation to temporary convention, but is an achievement of combinations of response which do, as a matter of fact, fit well together. Whether or not a

measure of such skill can be obtained in terms of relative sensitivity to errors or false starts is indeed still a matter for investigation; but at least this hypothesis is not beyond the bounds of an empirical

Note.—Most of the work which I have referred to in these lectures is as yet unpublished, though it has been the subject of a large number of reports, the great majority of them from the Cambridge Psychological Laboratory. I wish to acknowledge first the generous support by the Medical Research Council, through their support by the Medical Research Council, through their establishment of a Unit of Applied Psychology at Cambridge; by the R.A.F., chiefly through the Flying Personnel Research Committee; and by the Ministry of Supply, mainly through bodies concerned with tracking problems and the development of servo-mechanisms. There is practically no member of the research and teaching staff of the Cambridge Psychological Laboratory who has not contributed in important ogical Laboratory who has not contributed in important nensure to the success of the undertakings involved, but it is perhaps permissible to refer especially to the insight and initiative of the late Dr. K. J. W. Craik and to the vital experimental studies of Dr. W. E. Hick, Miss M. A. Vince, Dr. D. Russell Davis, Dr. N. H. Mackworth, Dr. A. W. Carpenter, and Mr. G. C. Grindley. Grindley.

'Benadryl' Treatment of Penicillin Allergy

By G. DEAN

(From the British Medical Journal, i, 7th June, 1947, p. 823)

Accounts of the allergic response to penicillin have appeared recently in the journals. These reactions have been both to intramuscular and local application of the drug. The commonest reaction is urticaria alone, but occasionally a full anaphylactoid response is seen with fever, hydrarthrosis, enlargement of the lymph glands, and bronchial spasm. This often occurs 10 to 14 days after the commencement of penicillin treatment 14 days after the commencement of penicillin treatment and resembles serum sickness. The intense pruritus which accompanies the urticaria is usually the most troublesome feature, causing scratching and inevitable insomnia.

A patient of mine (G. A.), a girl, aged 19 years, developed a paronychia, and I first saw her with pus under the left thumb-nail and slight lymphangitis. The nail was removed, penicillin in oil, 125,000 units in i ml., was given daily for three days, and the thumb healed uneventfully.

Ten days after the commencement of penicillin she Ten days after the commencement of penichina sale developed an urticarial rash on the back and shoulders; this was associated with intense itching. She had no family or personal history of allergy, and as far as could be ascertained, she had not been exposed to any other allergen. The following day, after a sleepless night, she had a temperature of 100°F. (37.8°C.). There was generalized urticaria, which was most marked about the face and she was also dyspresic. On There was generalized urucaria, which was most marked about the face, and she was also dysphesic. On examination the axillary and inguinal glands were enlarged; on auscultation of the chest there was a marked expiratory wheeze; there was no evidence of hydrarthrosis. Calcium lactate 30 gr. (2 g.) and phenobarbitone 1 gr. (65 mg.) were given six-hourly, but the following day the symptoms had increased.

Having used 'henadryl' (dimethyl aminosthyl hans

Having used 'benadryl' (dimethyl aminoethyl benzhydryl ether hydrochloride) successfully in angioneurotic ædema, I commenced treatment with 100 mg. (two capsules) at once and a further 50 mg. six-hourly. The response was most dramatic; within an hour all urticaria had disappeared, the itching and dvspnca ceased, and the patient was symptom-free. There has been no

relapse.

While further cases will have to be described, 'benadryl' appears to be the drug of choice in the long-term treatment of anaphylactoid phenomena, 'benadryl' being perhaps to adrenaline what trinitrin is to amyl nitrite.

^{*} Princeton University Press, 1945 (in England, Oxford University Press).

Folic Acid in Agranulocytosis

By D. A. K. BLACK

and S. W. STANBURY

(Abstracted from the Lancet, i, 14th June, 1947, p. 827)

Ir has been known for some time that folic acid is effective in correcting nutritional cytopenia in monkeys; and the granulopenia produced in rats by sulphonamides can also be prevented by folic acid. In human beings, Menten and Graff found that sulphonamide granulopenia gave no very definite response to pyridoxine and folic acid, but their daily dosage of folic acid was less than 0.2 mg. Watson et al. reported improvement in irradiation leucopenia with folic acid.

In the two cases of agranulocytosis reported in this article the granulocytes returned to the blood-stream within forty-eight hours of giving adequate doses of

folic acid.

Reviews

AN INTEGRATED PRACTICE OF MEDICINE,-BY Harold Thomas Hyman. Complete 4 volumes. W. B. Saunders Company, Philadelphia and London. Pp. 4336. Illustrated. Price for the complete work, £12-10-0

This book is Alladin's magic ring on a medical practitioner's finger. He will open the index volume, go through the appropriate table or tables, and come to the diagnosis, the treatment and the prognosis. Of tables there are 319 and all are integrated by cross references. Of indexes too there are several: the index of signs and symptoms, the general index and the index of illustrations in a special volume, and the last two indexes with every one of the four remaining volumes. Tables of contents, one for each volume, are full of details. Illustrations are plentiful. Enormous labour has been spent in the preparation of this work.

The practitioner can read the book as a textbook too. It supplies up-to-date information on all items a general practitioner is interested in. Perhaps it will give him

more than he really wants or needs.

How the author and his team of collaborators and editors are going to keep the book up to date worries a sympathetic reader. Under yellow fever, for instance, the newly discovered jungle variety of it has been mentioned but the vector concerned has not been mentioned (p. 477). The latter is bound to be discovered one of these days. As a matter of fact, A. leucocelænus, Hæmagogus capricorni and certain Sabethene mosquitoes have been incriminated already by other writers. Then there are the defects inseparable from first editions, for instance, figure 72D on page 470, figure 94 on page 555 and figure 95 on page 558, and printer's errors, for instance, page ix, line 10 (punctuation) and page 391, line 1 (heading). Perhaps a looseleaf book with arrangement for replacement of time expired and defective items would have been a better proposition in spite of its greater bulk because of proposition, in spite of its greater bulk because of thicker paper.

The printing is excellent. The paper could have been

better. The price is not unreasonable.

S. D. S. G.

AN INTRODUCTION TO GASTRO-ENTEROLOGY:
A CLINICAL STUDY OF THE STRUCTURE AND
FUNCTIONS OF THE HUMAN ALIMENTARY
TUBE.—By James Dunlop Lickley, M.D. 1947. John Wright and Sons Limited, Bristol. Pp. vill Illustrated. Price, 8s. 6d.

This small book is intended 'for those beginners who are interested in approaching from a scientific aspect

the study of some of the problems arising in the diagnosis and treatment of disorders of the alimentary The subject is approached along anatomical and physiological lines and an attempt is made to correlate the physiological facts and theories with the signs and symptoms of the commoner diseases of the alimentary tract. In this way the author presents a simplified account of its structure and working and of their practical application to clinical conditions. The book should stimulate scientific interest in the subject which is of everyday importance to physicians.

M.D. 1946. J. and A. Churchill Limited, London. Pp. xi plus 587, with 170 illustrations, 19 in colour. Price, 45s.

This book is written not only for the ophthalmologist but also for the neurologist and the general practitioner, all of whom will find various parts of particular interest to them.

The author commences by describing diseases of the retina resulting from disturbances in circulation, including hypertension, nephritis and diabetes. The next section deals with diseases of the retina resulting from vascular malformations including Coats' disease, Sturge-Weber disease and the Von Hippel-Lindau Syndrome.

Next come degenerative diseases of the retina on a hereditary basis including among many others, amaurotic family idiocy, Niemann-Pick's disease and Bourneville's disease.

Part IV describes inflammatory diseases of the retina and then follows a chapter on retinal tumours.

Some aspects of retinal detachment and developmental anomalies are followed by a description of radiational injuries.

A selected bibliography is given at the end of each section.

E. J. S.

DISEASES OF CHILDREN'S EYES .-- By Toggart, M.A., M.D. (Cantab.), F.R.C.S. (Eng.). 1947. Henry Kimpton, London. Pp. xvi plus 288, with 210 illustrations including 32 coloured plates. Price, 42s.

This book starts with a clear and fairly detailed description of the anatomy of the eye, its adnexa and the visual pathway and nervous connections which is mainly illustrated by the beautiful pictures from Wolff's Anatomy of the Eye. A rather brief description of the development of the eye comes next followed by chapters on developmental abnormalities.

Diseases and injuries of the eye with special reference to their clinical manifestations in childhood are then given with many practical points and hints acquired by the author at the Hospital for Sick Children, Great Ormond Street, London.

The printing and general appearance of the book is up to the high standard we expect from Henry Kimpton.

E. J. S.

DIAGNOSTIC EXAMINATION OF THE EYE .-- By Conrad Berens, M.D., F.A.C.S., and Joshua Zuckerman, B.Sc., M.D., C.M., F.A.C.S. 1946. J. B. Lippincott Company, Philadelphia and London. Pp. xxi and 711, with 410 illustrations including 48 in colour on 13 plates. Price, £4-10-0

This enormous book is divided like Gaul into three parts. The first part describes in much detail how to take and record the history of an ophthalmological case and lists many of the conditions that may cause the various symptoms. There is next an extensive and detailed description of how to examine the eye and its adnexa by general survey, inspection, palpation and auscultation. Tests for visual acuity are next given followed by the ordinary methods of investigation of



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the movements with the differential diagnosis of anomalies of convergence and divergence. Perimetry, scotometry, slit lamp examination and ophthalmoscopy are then described and many illustrations of conditions seen with the slit lamp and oplithalmoscope are given. Transillumination and the method of using the gonioscope come next followed by detailed description of retinoscopy and refraction. Tonometry ends part I.

Part II describes tests for colour vision, fusion sense,

depth perception, the light sense.
Part III gives information on ocular standards vision, etc., required for various services in the U.S.A. followed by lists of symptoms and signs found in common general diseases and conditions. Finally we have the most useful part of the book—supplementary examination and methods of examination. Ophthalmology abounds with special instruments and methods of examination, many seldom used or seen and of which most ophthalmologists only know of the more common. The book describes over 80 of these different procedures and for this alone it will be of great use. Of these and for this afone it will be of great use. Of these methods may be mentioned—gonioscopy, ophthalmodyanometry, methods of testing for sensitivity to lens protein or uveal pigment, study of the field of diplopia, measurement of the angle of anomaly, the duochrome test, angioscotometry, exophthalmometry, keratometry, biophetometry, telescopic and contact lenses biophotometry, telescopic and contact lenses.

E. J. S.

A PRACTICAL TEXTBOOK OF LEPROSY .-- By R. G. Cochrane, M.D., Ch.B. (Glas.), F.R.C.P. (Lond.), D.T.M. & H. (Eng.). 1947. Oxford University Press, London. Pp. xi plus 283. Illustrated. Price, 42s.

Dr. Cochrane is a leprosy worker of repute and has long and varied experience in the different fields of leprosy work such as teaching, treatment and research. He is, therefore, in a position to write on the subject with authority. By the production of this book the author has removed a long-felt need for a book on leprosy describing in detail the treatment and control of the disease.

In 22 chapters and 2 appendices the book deals with the atiology, epidemiology, pathology, symptomatology, diagnosis, differential diagnosis, treatment and prevention of leprosy. The author has long been connected with the development of leprosy work in Madras, and it is, therefore, natural that the background of the book is provided by the conditions and findings in

The printing and get-up of the book, and the illustrations are excellent. There are, however, a few errors and omissions in the printing. For example, on page 124, there appears a statement to the effect that the preparation of ethyl esters is a comparatively simple matter and details of the preparations are added as an appendix to this chapter', but this appendix is not to be found either at the end of the chapter or at the end of the book. Again, in the Bibliography it is stated that 'the main references are listed under chapters', however, as list effective to the content of the content chapters': however, no list of references appears under individual chapters but an alphabetical list of selected

references is found under Bibliography.

There are certain statements in the book regarding which there may be considerable difference of opinion. which there may be considerable difference of opinion. For example, on page 44, there appears a statement that 'lepromin reaction (excluding the reaction produced by extraneous tissue material) can only be produced in the presence of a primary focus, and, therefore, is analogous to the Mantoux test'. The results of the lepromin test in the areas where leprosy is endemic do not support this gentemport, singular products. is endemic do not support this statement; since positive results have been reported in persons living in areas where chances of exposure to leprosy infection are remote, even when refined antigen has been used. Again under diagnosis and differential diagnosis, there are considered only two diagnostic signs of leprosy, namely the presence of anæsthesia and the presence of leprosy bacilli. It is now generally agreed that the presence of thickened nerves, both the nerve trunks

and cutaneous nerves supplying the patches of leprosy, is a characteristic feature of leprosy, nerve thickening being not found except in very rare conditions. In the chapters on Pathology is described and illustrated

a histological feature which is considered characteristic of 'intermediate' or 'border-line' lesions. This consists of granuloma with tuberculoid feature such as foci of epithelioid cells and giant cells, but in which sub-epithelial layer remains clear, and becomes highly vascular. In the experience of the reviewer this feature is not confined to the 'intermediate' or 'border-line lesions, but is often found during the state of reaction in true tuberculoid lesions, as judged by the results of

In true tuberculoid iesions, as judged by the results of lepromin test and the subsequent stage of the disease. In conclusion it may be said that the book under review is an excellent all-round book on the subject, and is really what it claims to be—A Practical Textbook on Leprosy. It would be very helpful for the medical officers in charge of leprosy institutions, and others engaged in leprosy work.

D.

MORELL MACKENZIE: THE STORY OF A VIC-TORIAN TRAGEDY.—By R. Scott Stevenson. William Heinemann (Medical Books) Limited, 194. Illustrated. viii London. sulg Price, 15s.

ONCE upon a time a British surgeon through sheer effort rose to eminence professionally and socially. He was sent for to examine the throat of the Crown Prince was sent for to examine the throat of the Crown Prince of Germany who lived for a while as the Emperor Frederick III. He disagreed with the German surgeons' diagnosis of cancer and later made public his views which were not approved by the medical profession in England.

The Emperor died of cancer in 90 days. The surgeon was Morell Mackenzie, the famous laryngologist, who has left his mark on laryngology.

has left his mark on laryngology.

The writer of the book, also a laryngologist, has painted a vivid picture of the professional and social life in Victorian days.

It is well worth reading.

D. G.

JONATHAN HUTCHINSON: LIFE AND LETTERS .-By Herbert Hutchinson. 1948. William Heinemann (Medical Books) Limited, London. Pp. 257. Illustrated. Price, 12s. 6d.

To the present generation of doctors the name of Jonathan Hutchinson is associated with certain signs of syphilis, but there was hardly any branch of medicine to which he did not make any contribution. For more than 20 years he was surgeon to London Hospital, and he was also on the staff of hospitals for chest, skin he was also on the stan of nospitals for chest, skin and eye diseases. It was an extraordinarily prolific period during which he made original researches on such a variety of diseases that he came to be known as a 'generalized specialist'. His interest in lerposy was life-long, and even when he was past seventy, he went to South Africa and India to investigate it on the spot. In the midst of arduous professional work he found time to edit medical journals and write voluminous books on surgery and syphilis. As a clinical teacher he attracted larger number of students to his demonstrations than any surgeon of his time in London. He rose to become Fellow of the Royal Society and President of the Royal College of Surgeons. Nor were his activities confined to medical profession alone. He was very fond of farming, and founded museums for propagating general education where he gave lectures on every conceivable subject from paleontology to modern English poetry. He had strong and original views which he did not easily relinquish, and he was views which he did not easily relinquish, and he was a good fighter once he was convinced of a cause. Such a life is worth knowing, and it is adequately described in this biography. In it are included many of his letters to his wife, which reveal him as a man of noble ideals and deep religious conviction with a will to do good to mankind.

The undermentioned officer of the I.M.S. (E.C.) reverts from I.A.M.C. and is seconded for service in the R.I.N.V.R.:-

Captain S. K. Bardhan Ray. Dated 17th May, 1947. LEAVE

Lieutenant-General Sir Robert Hay, K.C.I.E., C.S.I., lately Director-General, Indian Medical Service, is

granted leave on average pay preparatory to retirement for 8 months with effect from the 15th August, 1947.

Lieutenant-Colonel E. A. O'Connor, Chief Medical Officer in the Western India and Gujarat States Agencies and Residency Surgeon, Rajkot, has been granted war concessional leave in India for 1 month and 16 days combined with leave on a concessional leave in India for 1 month and 16 days combined with leave on average pay for 8 months and half-average pay for 1 year 6 months and 14 days, with effect from the afternoon of the 14th August, 1947, pending retirement.

Major G. R. C. Palmer, Residency Surgeon,

Bangalore, has been granted leave on average pay for

Bangalore, has been granted leave on average pay for 6 months and 15 days combined with leave on half-average pay for 3 months, with effect from the 15th August, 1947, preparatory to retirement.

Major J. D. Grant, an Agency Surgeon, has been granted war concessional leave in India for 1 month and 3 days combined with leave on average pay for 8 months and on half-average pay for 1 year 6 months and 27 days, with effect from the 15th August, 1947, pending retirement. pending retirement.

Captain D. H. Harrison, an Agency Surgeon, was granted war concessional leave in India for 12 days combined with leave on average pay for 8 months and on half-average pay for 1 year and 20 days, with effect from the forenoon of the 19th March, 1947, pending retirement.

RETIREMENTS

Lieutenant-Colonel D. P. Bhargava, O.B.E. Dated 12th October, 1947. Colonel J. R. Kochhar. Dated 2nd January, 1948.

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE Lieutenant-Colonel A. Ba Thaw. Dated 13th March, 1947.

RELINQUISHMENTS

The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of Lieutenant-Colonel:—

INDIAN LAND FORCES-INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Colonel Suhas Kumar Roy. Dated 7th August, 1947. The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of Major:—

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Ty. Major Manjeshwar Dated 23rd September, 1945. Gopalakrishna Prabhu.

The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of Captain. His services were placed at the disposal of the Government of Bihar with effect from the date specified :-

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Captain Suresh Kumar Varma. Dated 25th October, 1946.

The undermentioned officers are permitted to relinquish their commissions on release from army service and are granted the honorary rank of Captain:—

INDIAN LAND FORCES-INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commissions)

.. Captain Madhav Raghunath Thakar. Dafed 16th April; 1947. thing is a side

Captain Ranbir Singh. Dated 26th November, 1945. Captain Tarapada Banerjee. Dated 21st October,

Captain Makhan Singh Maini. Dated 26th April. 1947.

The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of Captain:—

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS Emergency Commission)

Captain Zafar Mohammad Pandher. Dated 16th December, 1946.

The undermentioned officer is permitted to relinquish his emergency commission on reversion to the I.A.M C. (S.M.S.) :-

INDIAN LAND FORCES-INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Captain Charles Andrew Martin. Dated 1st April, 1946.

The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of Surgeon-Lieutenant:—

INDIAN LAND FORCES-INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS (Emergency Commission)

Captain Vasant Gopal Dabholkar. Dated 3rd July, 1946.

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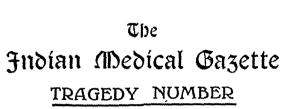
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A TRACEDY the like of which had not shocked the world for 1,915 years enveloped India in gloom on the 30th January, 1948 ! Medical men are affected like other men. Medical India mourns.

The Indian Medical Gazette is bringing out a special number in two months' time. Contributions are invited on all subjects which mitigate suffering and thus would have found favour with the Mahatma.

The following subjects are suggested:-

Psychology of lesser men, men and supermen.

Social fabric, population pressure, poverty and misery. Crime and punishment.

The irresistible impulse.

Juvenile and senile delinquencies. Capital punishment.

Hanging as capital punishment.
Shooting as capital punishment.
Preservation of human dignity and liquidation of unwanted life.

Euthanasia.

Operation for abortion. Killing and callousness.

Humane slaughter.

Frond, gluttony and fasting.

Stimulating drugs, their use and abuse.

Beverages, intemperance and prohibition.

The present system of education in general and medical education in particular.

Spen of hymnel life.

18. Span of human life.

Contributions are not limited to medical men only: Veterinary sur-geons, missionaries, lawyers, educa-tionists and social workers are also contributing.

Original Articles

TYPHUS IN BOMBAY

PART III: IDENTIFICATION OF STRAINS

By S. R. SAVOOR N. S. VAHIA

and

D. W. SOMAN

(An Enquiry under the I. R. F. A., Haffkine Institute, Parel, Bombay)

In the first two parts of this paper dealing with the clinical features and epidemiology references were made to the isolation of typhus strains from man and from rats. The rigid criteria of typhus infection are isolation of typhus strains, demonstration of the causal organism and cross-immunity tests with known strains of typhus. As this is the first occasion on which investigation in a fairly comprehensive manner has been carried out in India, details of method and of procedure have been given which would otherwise be unjustifiable.

Isolation of typhus strains from man

In the isolation of strains advantage was taken of the enhanced susceptibility to the typhus infection of the guinea-pigs placed on a vitamin-free diet, to which attention was drawn by Zinsser et al. (1931). The diet consisted of autoclaved milk and rolled oats for a period of about 10 days, approximately six days before and four days after inoculation, which appears to be an optimal period.

About 5 c.cm. of blood were taken from the patient as soon as a diagnosis was made and allowed to clot. The serum was pipetted off, the dry clot washed in saline, then broken up in a bottle containing glass beads and suspended in about 5 c.cm. of saline. Three c.cm. of this were inoculated intraperitoneally into a guinea-pig and 0.5 c.cm. into each of two mice. In the event of the guinca-pig not reacting with fever, the mice were killed—one on the 15th day and the other on the 18th day—and a suspension of brain and spleen inoculated into one guinea-pig and two mice.

A washed suspension of red blood cells only, prepared by centrifuging defibrinated blood, was just as satisfactory as the above. It would appear that the virus is somehow associated with the blood cells, though it cannot be demonstrated in stained smears of blood.

cannot be demonstrated in stained smears of blood.

Nine attempts were made to isolate the virus by the method first mentioned: five succeeded. The typhus strains were labelled Bombay I, Bombay II, and so on.

The typhus strains were maintained in the guinea-

The typhus strains were maintained in the guineapig and the mouse, the guineapig being used for passage and the mouse as a standby in case of a misadventure to the guineapig. In the mouse to mouse passage there is risk of the strain being lost. To secure economy in the number of animals the brains of the guineapigs on the third day of fever were used for passage, as the incubation period with this inoculum was longer than with the tunica washings of a reacting animal. Again, it had been observed that if spleen or tunica washings were used for passage, secondary concomitant infection with Toxoplasma caviæ resulted sooner or later with the loss of the typhus strain. For

the routine maintenance of strains in guinea-pigs vitamin-free diet is not necessary.

Considering that a diagnosis was not made earlier than the 8th day and in one instance as late as the 12th, one day before the temperature touched normal, it would appear that isolation of typhus strains is not so difficult as it is supposed to be.

Of the five strains isolated, three were recovered in the first instance from the guineapig, and all the five from mice. The mouse therefore is a better animal than the guinea-pig in the isolation of strains and it would be noted that as small a quantity as 0.5 c.cm. of blood is sufficient to provoke an infection in this animal.

Reactions of the typhus strains in laboratory animals

The guinea-pig.—Guinea-pigs inoculated with the tunica washings of a reacting animal showed temperature response in 4 to 6 days with a scrotal swelling (tunica reaction) in 100 per cent of the animals. When the inoculum was a suspension of the brain from a reacting animal on the third day of fever, the temperature response appeared between the 7th and 9th day; the scrotal reaction then appeared in only about 70 per cent of the animals. Whatever the inoculum, the tunica reaction occurred about the same time as the fever, a day or two before or following the pyrexia, and ordinarily lasted for about 3 days. This reaction commenced with a reddening of the skin of the scrotum followed by swelling and cedema with an inability to reduce the testis into the abdominal cavity. Adhesions of the testis or necrosis of the scrotum never resulted. This reaction was quite unlike that seen in experimental infections of the guinea-pig with Pfeifferella mallei (Straus' reaction), P. whitmori and Spirillum minus.

The testis, when removed on the first day of the scrotal swelling, showed a congestion of the tunica vessels, petechial hæmorrhages on the polar fat, and a thick, whitish, sticky exudate. Smears prepared from this exudate revealed an intense cellular reaction consisting of polymorphonuclears, monocytes and desquamated serosal cells. In a few of the latter, Rickettsia mooseri were demonstrated by proper staining. In the scrapings they were more numerous than in the exudate. In the smears stained by the Giemsa method, these had the form of fine delicate bacilli 1.0 to 2.5 in length and 0.2 to 0.3 in width, with the ends stained deep blue and the intermediate portion light blue. The polar components were linear and slightly tapered at the proximal ends. The deeply stained ends varied in length and width within fairly narrow limits. In morphology and staining reactions they were quite unlike R. tsutsugamushi in length, width and in the polar components.

The spleen of the guinea-pig was always enlarged about 2 to 3 times the normal size on the

third day of fever when the passages were

usually made.

The white rat.—Two strains of typhus were this animal. Freshly studied in strains when inoculated by the intraperitoneal route killed the white rats between the 15th and 20th day; but those maintained in the guineapigs for some generations of passage failed to do Intraperitoneal inoculations produced a fitful temperature lasting for 2 to 3 days. Unlike a guinea-pig the rat did not react with a scrotal swelling, though many infected animals showed a reddening of the skin of the scrotum. Scrapings of the tunica vaginalis or of the peritoneum showed the presence of rickettsiae on the 15th to 17th day of inoculation.

The mouse.—The mouse inoculated by the intraperitoneal or subcutaneous route showed no sign of infection, and bred as the normal animal. The temperature of this animal was not taken; but proof of infection was obtained by passage of the brain or the spleen into guinea-pigs. The mouse did not die of the infection. When killed between the 2nd and 4th week an enlargement of spleen was noted. The brain and spleen of a mouse remained infective for a period not less than 2 and occasionally 3 months after inocula-

The rabbit.—Sixteen rabbits were inoculated intraperitoneally with tunica washings of reacting guinea-pigs, eight with the Bombay I strain and four each with the Bombay II and Bombay III strains. Twelve gave Weil-Felix reactions with Proteus OX19. The titres rose from 0 or 1/25 to between 1/125 and 1/250. The titres against Proteus OX2 were not uniformly positive and in no instance rose beyond 1/50. There was no agglutination against Proteus OXK.

Reservoir of typhus in Bombay

Until recent times typhus fever was regarded as the same disease whenever it occurred and was considered to be carried only by the bodylouse. The observations of Maxey (1926) on the epidemiology of the endemic typhus in the Southern States of U.S.A. clearly pointed out that an animal reservoir existed and that it was probably a rodent. The isolation of a typhus strain by Dyer et al. (1931) from fleas on rats caught in a house in which a case of typhus had occurred and of another by Mooser, Castaneda and Zinsser (1931) from the brains of rats indicated that the rat was the reservoir of endemic typhus in U.S.A. In India, Covell (1936) had isolated a typhus strain from wild rats in Kasauli, and Wolff (1939) from rat fleas in Ceylon; Lewthwaite and Savoor (1937) from the house rats in Malaya. Since many strains of typhus have been isolated from rats from many parts of the globe, it is highly probable that the rat is the principal reservoir of endemic typhus throughout the world.

Isolation of a typhus strain from house rats.— The Executive Health Officer of the Bombay Municipal Corporation kindly arranged to trap

rats in a house in which a case of typhus had occurred, and send them to the institute for the isolation of typhus strains. Smears were made from the blood of these rats and those showing Spirillum minus and trypanosome infections were disearded. The brains and spleens of the rest, 23 in number, were pooled in lots of 4 and each lot inoculated into two guinea-pigs. With a view to facilitating the isolation of typhus strains guinea-pigs were placed on a vitaminfree diet. One strain was isolated. This strain produced the Neill-Mooser reaction. Scrapings from the tunica vaginalis revealed R. mooseri in the serosal cells. Four rabbits inoculated with this strain gave Weil-Felix reactions with Proteus OX19 in a titre between 1/125 and 1/250.

This strain, however, was soon lost as a result of a concomitant infection with Toxo-

plasma caviæ.

Attempts to isolate typhus strains from rat fleas.—As cases of typhus had occurred in all the districts of the city throughout the year, it appeared that the isolation of a typhus strain from fleas on rats would not present many difficulties.

Rats caught all over the city of Bombay were sent to the Haffkine Institute for evidence of plague. rats so sent were destroyed in a cement-concrete enclosure. Hundreds of fleas drop off the rats and could always be collected from this enclosure. It was thought that if a mouse was placed in the enclosure as a live-bait for a short while, fleas would be attracted, and by feeding on the animal, might, if they were infected, transmit typhus to them. Six attempts were made. On each occasion it was seen that there was a considerable number of fleas on the animal. These experimental mice were killed at the end of 3 weeks, a period sufficient to infect the mouse, and the brain and spleen of each inoculated into two guinea-pigs. No strain was isolated by this procedure.

Transmission of typhus by the agency of X. cheopis

Five successful experiments were carried out with two out of the five strains isolated. One strain was transmitted from (a) guinea-pig to guinea-pig, (b) rat to rat, and (c) mouse to mouse. The second strain was transmitted from (a) mouse to mouse, and (b) mouse to a white rat.

The technique employed is briefly follows :--

The experiments were carried out in wide-mouth glass bottles (when the guinea-pig was used, the transmission experiment was carried out in glass tanks) covered at the top with a fine-mesh wire gauze to prevent the escape of the fleas. Dry oatmeal was given as food once a day and water provided through a tube, passing through the wire gauze, from a container.

At the bottom of the bottle, sand was put together with sawdust to absorb the urine.

In each experiment about 200 freshly hatched

laboratory-bred X. cheopis were introduced in the bottle along with the respective infected animal: guinea-pig on the first day of fever, mouse or white rat on the 12th day of inoculation. The fleas were allowed to feed on the infected animal for one day; then the animal was removed, de-flead and discarded. A normal mouse was then introduced into the bottle to provide a source of food for the fleas. At the end of 12 days, this mouse was removed, de-flead and discarded. The fleas in the bottle were then removed and put into another similar bottle together with a fresh guinea-pig, mouse or white rat. The fleas were allowed to feed on this animal for 1 to 2 days. This test animal was then removed, de-flead and kept under observation and later passaged into guinea-pigs: the guinea-pig on the 12th day, the mouse on the 15th and the rat on the 17th. (Previous experiment by one of us, S. R. S., with the urban typhus of Malaya, had indicated that on the days selected as above for feeding the fleas, passage of animals, etc., successful transmission had taken place.)

All the guinea-pigs reacted with fever and scrotal swelling, indicating that there was a successful transmission.

Experimental criteria for strains of murine origin

The mere isolation of a typhus strain from a rat does not necessarily go far in incriminating the rat as the reservoir of the disease in man. It is necessary to show that the typhus strains of human origin have the characteristic of murine typhus. The louse-borne typhus in man and flea-borne typhus in the rat may exist side by side, as for instance, in such historic centres of typhus epidemic as Moscow (Epstein and Silvers, 1934) and Leningrad (Klimentowa, 1935).

Nicolle recognized two types of typhus infections: 'le typhus historique' and 'le typhus murine'. They are clinically the same in man; both of them provoke the same serological response in the rabbit. But the two types show certain differences in experimental infections in the laboratory animals (vide infra).

Nicolle (1933) drew attention to a distinction between the virus of Old World typhus and that of New World that is based on the survival of the virus in rat passage. The epidemic typhus virus of European origin could not be maintained in rats, using the brain suspension as the inoculum, beyond 13 generations of passage. The virus of rat typhus on the other hand could be maintained practically indefinitely.

If a virus were to survive in nature it should develop mechanisms for perfect adaptation to its host. It can, therefore, readily be understood why it is easy for the murine typhus but difficult for the louse-borne typhus (in which probably there is no other reservoir than man) to survive in the rat passage. Nicolle's experimental criterion of distinguishing the rat strains from human strains being, therefore, based on a critical appreciation of biology, would appear to be necessarily more accurate and reliable than the ones based on fever in the rat, tunica reaction in the guinea-pig and so on. Lewthwaite and Savoor (1936) had observed that this criterion held good in the case of scrub typhus in which the rat is the reservoir.

Experiment.—Two white rats and one guineapig were inoculated intraperitoneally with a brain suspension of a passage guinea-pig of the Bombay I strain. The white rats reacted with fever for 2 to 3 days. This febrile reaction

being fitful, the rats were killed on that day when the guinea-pig inoculated at the same time would have been used for passage. The brains and spleens of the rats were pooled, and a ground suspension inoculated into 2 rats and one guinea-pig (2nd generation of passage). The strains were thus maintained for 20 generations of passage. It was seen that the virulence of the strain was not altered by such maintenance in the rats.

Immunology

Relation of the Bombay typhus strains to one another.—Three strains labelled Bombay I, II and III were compared with one another. The tests were not carried out at one time, but were done as circumstances permitted during a period of about 18 months. The 'challenge' dose was, in each instance, the tunica washings of a reacting guinea-pig on the first day of scrotal swelling, and represented $\frac{1}{3}$ to $\frac{1}{2}$ of one tunica vaginalis; controls made on each occasion reacted typically with fever and tunica reaction. The animals were 'challenged' at least 3 months after they had recovered from a previous experimental infection.

(a) Eight guinea-pigs convalescent after infection with the Bombay I strain were reinoculated intraperitoneally, four with the Bombay II strain and 4 with the Bombay III strain. All animals were found to be immune.

(b) Eight guinea-pigs convalescent after infection with the Bombay II strain were re-inoculated intraperitoneally, four with the Bombay I and four with the Bombay III strains. All were found to be immune.

(c) Four guinea-pigs convalescent after infection with the Bombay III strain were re-inoculated with the Bombay I strain. All were found to be immune. It was thus seen that there was a complete and mutual cross-immunity between the three strains of typhus.

Relation between the endemic typhus strains of U.S.A. and Bombay typhus.—(a) Six guineapigs convalescent after infection with Bombay I strain were re-inoculated with the 'Wilmington' strain of endemic typhus of U.S.A. All reacted, two with tunica reaction. The fever, however, was mild and lasted for 2 to 3 days compared with pyrexia of 5 to 6 days' duration and tunica reaction in all the six controls.

(b) In the converse experiment, six animals convalescent after infection with the Wilmington strain were found to be completely immune to the strain of Bombay typhus.

The above findings are interpreted to mean that the typhus strain of Bombay is much less virulent than the American strain (vide infra).

The immunogenic value of typhus vaccine against Bombay typhus.—Six guinea-pigs were inoculated subcutaneously on three occasions at weekly intervals with 0.5 c.c. of a commercial yolk-sac typhus vaccine manufactured in U.S.A. labelled 'epidemic and murine'. They were 'challenged' 10 days after the third dose, along

with four normal animals, each with approximately 1/10 of brain virus of a passage guineapig. Four animals were found to be immune; two animals reacted with fever for 2 days only. All the controls reacted with fever for 5 to 6 days.

This experiment showed that we are dealing with a typhus strain and that the vaccine has a considerable prophylactic value against local typhus in the guinea-pigs.

Discussion

The identification of strains of the typhus group of diseases is made by the following methods: (1) A study of the reactions of experimental infections in the guinea-pig, the rat, the mouse and the rabbit; (2) cross-immunity tests in the guinea-pig with known strains; (3) in recent years attempts have been made to identify by means of agglutination and complement-fixation tests with suspensions of rickettsiæ and convalescent sera of man or experimentally infected animals.

The cross-immunity tests in the guinea-pig are not helpful in distinguishing the flea-borne endemic typhus from the louse-borne variety, as there is a complete and reciprocal crossprotection between these strains in this animal. However, the experimental infections of the two types in the laboratory animals are sufficiently distinctive for differentiation. The flea-borne typhus in the guinea-pig regularly produces the tunica reaction, in the rat an infection with fever. The louse-borne typhus on the other hand seldom provokes a tunica reaction in the guinea-pig and produces only a silent infection in the rat. While these differences serve as a general guide in distinguishing the two types, it should be borne in mind that they are not absolute. The higher virulence of typhus for the rat is not an absolutely fixed character, neither is the ability to produce a scrotal swelling constant in the murine strain and altogether absent in a louse-borne strain. Transitional forms between the two types exist; and strains of epidemic typhus occasionally produce a scrotal swelling (Pinkerton, 1929). Castaneda and Silva (1939) had isolated many strains of typhus which were intermediate between the two types.

All the five Bombay typhus strains gave the tunica reaction in the guinea-pig. Two strains studied, produced fever and death in the white rat. For these findings the typhus in Bombay should be considered to be of murine origin.

Again, the survival of the Bombay I strain in rat passages without loss of virulence is consistent with a murine origin.

The transmission of 2 strains by X. cheopis probably has little significance as the louseborne typhus is stated to be flea-transmissible. Therefore the ease with which the 2 Bombay strains were transmitted on five occasions will not be regarded as convincing evidence of their murine origin.

The results of the cross-immunity require some comment. All the guinea-pigs after infection with the Wilmington strain were immune to Bombay typhus. On the other hand the Bombay typhus conferred only partial immunity against the Wilmington strain.

A parallel observation has been recorded in the case of the 'Western' and 'Eastern type' of Rocky Mountain spotted fever. These findings have been interpreted in terms of the virulence of the strains. It would appear therefore that the Wilmington strain is more virulent than the Bombay typhus strain, which is in accordance with the clinical finding that the typhus in Bombay is a mild disease.

The Bombay typhus strains were not identified by means of the complement-fixation test.

It may appear that by this technique the identifica-It may appear that by this technique the identifica-tion of typhus strains is by no means difficult. One of us (S. R. S.) attempted to correlate the result of the complement-fixation (C. F.) test carried out by Topping et al. on the serum of a patient suffering from Mysore typhus (case no. 25, Heilig and Naidu, 1944) and the results of the experimental infections in the laboratory animals with the typhus strain isolated from the same patient. The result of the C. F. test on this case and on two other cases of Mysore typhus were reported by Topping et al. as follows: 'These results indicate that the causative agent of these three cases is more closely related immunologically to the cases is more closely related immunologically to the rickettsia of Rocky Mountain spotted fever. We have no explanation for the cross-fixation at low titres with endemic typhus antigens. We have, however, occasionally seen serums from cases of Rocky Mountain spotted fever and endemic typhus that gave crossfixation with other antigen, but this is not common'.

The Mysore typhus strains gave the following reactions in experimental animals indicating a murine origin of the strain :-

(a) In the guinea-pig fever, Neill-Mooser reaction and presence of R. mooser; (b) in the rat fever and survival for 20 generations (Nicolle's criterion); (c) in the mouse a silent infection; (d) in the rabbit a Weil-Felix reaction with Proteus OX19; (e) the strain was transmitted by means of X. cheopis on two occasions:

(f) there was a complete and reciprocal cross-immunity with the Bombay typhus I. In view of the fact that the result of the C. F. test was at variance with other data, there appeared to be some shortcomings in the interpretations of the test. Before this technique could be utilized for identification of unknown typhus strains, the test should be extended by using a large number of strains isolated in different parts of the world.

Summary

1. An account is given of the method of isolation of typhus strains.

2. Five strains were isolated from man and one from rat and their reactions in laboratory animals studied. The strains gave in the guinea-pig fever and the Neill-Mooser reaction, in the rat fever, in the mouse a silent infection. These strains in the rabbit gave Weil-Felix reactions with Proteus OX19, feeble and erratic reaction with OX2 and no reaction with OXK.

3. Two strains were successfully transmitted by X. cheopis on five occasions.

4. One strain satisfied Nicolle's criterion of murine typhus by survival through 20 generations of passage in the white rat.

5. Three strains showed complete mutual

cross-protection.

Guinea-pigs convalescent after infection with the 'Wilmington' strain of U.S.A. were immune to Bombay typhus. Six guinea-pigs convalescent after infection with the Bombay strain were re-inoculated with the Wilmington strain, 4 reacted with fever and 2 with scrotal The temperature was mild in these swelling. experimental animals, lasting for 2 to 3 days compared with 5 to 6 days' duration in controls; scrotal reactions occurred in all the controls.

7. A commercial yolk-sac typhus vaccine gave complete protection to 4, and partial protection to 2 out of the 6 animals tested indicating that we were dealing with genuine typhus and that the vaccine has a considerable prophylactic value in the guinea-pigs.

Conclusion

The typhus in Bombay is of murine origin.

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TYPHOID FEVER IN CHILDREN TREATED WITH PENICILLIN AND SULPHATHIAZOLE

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Introductory

Until 1946 there was almost complete agreement on the point that Bact. typhosum was completely resistant to penicillin and sulphonamides. But Florey had prophesied that with more and better penicillin we should come to the stage of attacking it successfully.

Bigger's (1946) researches showed that penicillin and sulphathiazole when used together exert a synergic action on Bact. typhosum. In consequence of this research McSweeney (1946) treated six cases of typhoid fever in adults with full doses of sulphathiazole and large doses of

penicillin with apparently remarkable results. Evans (1946) carried out experiments the results of which suggest that a retarding effect is exerted by penicillin on the rate of growth of Bact. typhosum in vitro and in vivo. Basu (1947) treated seven critical cases of typhoid fever in adults with penicillin alone with apparently good results in six.

The present work embodies the results of treatment of typhoid fever in seven children with penicillin and sulphathiazole. Two cases (nos. 1 and 4) were treated with penicillin alone, and the rest with penicillin and sulphathiazole combined.

Case reports.—1. J. H., aged 4 years, Christian male.

Complaints.—Continuous fever, duration 16 days; swelling of the neck, duration 2 days.

Examination.—Patient looked seriously ill and was unconscious. Temperature 105°F., pulse rate 152 and respiration 34 per minute. Tongue dry and heavily coated. Bilateral parotitis. Moderate tympanites. Liver 1½ inches. Lungs normal. A hæmic murmur heard at the pulmonary area of the heart. Neck soft. Kernig's and Brudzinski's signs negative. Blood: total leucocytes 4,000, polymorphonuclears 80 per cent, lymphocytes 20 per cent, parasites nil. Widal reaction positive for Bact. typhosum ('H' in dilutions of 1/250 and 'O' 1/640).

Treatment.—He was put on routine typhoid treatment. Drugs, feeds, etc., were given by the nasal route. In addition penicillin was given (20,000 units intramuscularly every 3 hours) from the second day of hospitalization.

After four days of penicillin therapy the temperature came down to 97.4°F. but went up to 100°F. after 8 hours. The patient, however, began taking notice of his surroundings, the toxæmia diminished to a great extent and the parotitis was much reduced. After five days of penicillin therapy the temperature came down below normal and remained so for about 16 hours. Penicillin was stopped after five days. The temperature which rose after the stoppage of penicillin became remittent in type and came down in 6 days. The convalescence was uneventful.

It was a case of hypertoxic typhoid fever. Penicillin (800,000 units) effected in bringing down the temperature but it went up again although maintaining a lesser range, after penicillin was stopped. There was no question that the toxemia was considerably lessened all through this long fever and there was no complication

due to ulceration in the intestines. In other words, penicillin converted a hypertoxic case of typhoid fever to one of mildly toxic type.

2. S. K., aged 5 years, Hindu male. Complaints.—Continuous fever, duration 13

Examination .- Patient was deeply comatose and looked dangerously ill. Temperature 103°F., pulse rate 126 and respiration 26 per minute. Abdomen moderately distended. Liver 1 inch. Lungs both sides (middle and lower zones) congested. Heart sounds weak in all the areas. Neck soft. Kernig's and Brudzinski's signs Blood: total leucocytes negative. polymorphonuclears 84 per cent, lymphocytes 16 per cent, parasites nil. Widal reaction positive for Bact. typhosum ('H' in dilutions of 1/250). Urine analysis normal.

Treatment.—Routine treatment for typhoid fever was given. Drugs, feeds, etc., were given by the nasal route. In addition penicillin (20,000 units intramuscularly every 3 hours) and cibazol 0.5 g. t.d.s. for five days were given.

The case was one of hypertoxic typhoid fever. After five days of penicillin (800,000 units) and 7.5 g. cibazol the temperature gradually settled down, toxemia disappeared completely and the patient became conscious. Convalescence was free from any untoward symptoms. It could be concluded that penicillin and cibazol aborted the infection which otherwise would have pursued a longer course and might have produced serious complications which are very usual in such hypertoxic cases.

3. M., aged 4 years, Hindu male.

Complaints.—Fever, duration 30 days. It was, as reported by the relations, high and continued for 21 days after which there was no pyrexia for 4 days. The patient relapsed on the 26th day from the onset.

Examination.—Patient looked emaciated and non-toxic. Temperature 102°F., pulse rate 120 and respiration 22 per minute. No tympanites. Liver 12 inches. Heart and lungs normal. Blood: total leucocytes 5,500, polymorphonuclears 80 per cent, lymphocytes 19 per cent, large mononuclears 1 per cent, parasites nil. Widal reaction positive for Bact. typhosum ('H' in dilutions of 1/250).

Treatment.—For the first three days routine treatment for typhoid fever was given after which penicillin (15,000 units intramuscularly every 3 hours) and cibazol 0.5 g. were used.

It was a case of typhoid fever with relapse. After 240,000 units of penicillin and 3 g. cibazol the temperature was completely controlled. The convalescence was smooth. Small doses of penicillin and cibazol were effective because the case was one of mild relapse.

4. D. D., aged 9 years, Sikh male.

Complaints.—Continued fever, duration 9 days; delirium, duration 3 days.

Examination.—Patient was deeply comatose and looked very severely ill. Temperature

103°F., pulse rate 128 and respiration 30 per Moderate tympanites. Weak heart sounds. Lungs normal. Neck soft. Kernig's and Brudzinski's signs negative. Blood: total leucocytes 5,850; polymorphonuclears 67 per cent, lymphocytes 32 per cent, large mononuclears 1 per cent, parasites nil. Widal reaction for Bact. typhosum became positive on the 50th day from the onset ('H' in dilutions of 1/250). Urine and stool normal.

Treatment.—Routine typhoid line of treatment was followed. Drugs, feeds, etc., were given by the nasal route. In addition penicillin (20,000 units intramuscularly every 3 hours) and cibazol 0.5 g. t.d.s. were given for seven days. In the evening the patient started hæmaturia. Cibazol (of which he had received only 0.5 g.) was stopped. The rest of treatment was continued as before. Hæmaturia persisted. For this complication 2.5 c.c. calcium gluconate 10, per cent with vitamin C 100 mg. intravenously, and vitamin K (Kapilin) 5 mg. b.d. orally were given. Gradually hæmaturia stopped after about 96 hours. After 5 days of penicillin therapy the temperature became normal but did not remain so and ranged between 99°F. and 100°F. for the next 48 hours during which penicillin was continued. From the eighth day penicillin was stopped after which the temperature remained at the level of 99°F. for about 12 hours and then went up to 101.4°F. But by this time there was remarkable improvement in clinical picture as was evidenced by the return of consciousness, marked diminution in toxemia and disappearance of tympanites. The temperature became intermittent and remained so till the 35th day after which it was normal. To control the fever atebrin tablets ½ t.d.s. for 5 days and 2 c.c. of pyelopurin (Cipla) intravenously daily for 4 days were given with no effect.

It was a critical case of typhoid fever with hæmaturia and tympanites as complications. Hæmaturia was most possibly not due to cibazol of which he had received only 0.5 g. As judged clinically and by the very late appearance of positive Widal reaction the prognosis was grave. Penicillin helped in modifying the prognostic gravity, bringing down the temperature to a narrow range, considerably lessening toxemia and preventing other complications which might have cropped up in such a severe case of typhoid fever.

5. L., aged 7 years, Muslim male.

Complaints.—Continuous fever, duration one

Examination .- Patient was emaciated with very little toxemia. Temperature was 101°F., pulse rate 138 and respiration 40 per minute. There was corneal ulcer on the right eye. Heart, lungs and other systems normal. Blood: total leucocytes 5,000; polymorphonuclears 27 per cent, lymphocytes 72 per cent, large mononuclears 1 per cent, parasites nil. Widal reaction positive for Bact. typhosum ('H' in dilutions of 1/250).

Treatment.—In addition to routine treatment for typhoid fever and corneal ulcer he was put on penicillin (20,000 units intramuscularly every 3 hours) and 0.25 g. cibazol q.i.d. for five days.

The temperature settled down after only 320,000 units of penicillin and 2 g. cibazol because the infection was not severe. The convalescence was normal.

6. J., aged 7 years, Hindu male.

Complaints.—Fever, duration 18 days; deli-

rium duration 11 days.

Examination.—The patient looked acutely ill and was semicomatose. Temperature 101°F., pulse rate 114 and respiration 26 per minute. Delirious. Liver 1 inch. Lungs were congested at bases. Heart sounds weak. Investigations. Blood: total leucocytes 11,500; polymorphonuclears 73 per cent, lymphocytes 25 per cent, large mononuclears 2 per cent, parasites nil. Widal reaction positive for Bact. typhosum ('H'in dilutions of 1/125). Urine analysis normal.

Treatment.—Routine typhoid line plus penicillin (20,000 units intramuscularly every 3 hours) and cibazol 0.5 g. t.d.s. for five days from

the second day of hospitalization.

Notwithstanding the range of temperature being not very high the clinical picture was one of highly toxic typhoid fever. After four days of penicillin and cibazol there was dramatic improvement as manifested by the temperature touching normal, by the clearing of the cloudy state of the mind. After five days of penicillin (800,000 units) and 7.5 g. cibazol the temperature settled down and remained so. The convalescence was uncomplicated.

7. B. D., aged $3\frac{1}{2}$ years, Hindu male.

Complaints.—High continued fever (ranging between 101° and 104°F.), duration 26 days.

Examination.—The patient was stuporose, highly irritable and looked severely ill. Temperature 99°F., pulse rate 104 and respiration 24 per minute. Abdomen scaphoid. Heart sound weak. Lungs—a few crepitations at both bases. Neck soft. Kernig's and Brudzinski's signs negative. Blood: total leucocytes 8,000; polymorphonuclears 71 per cent, lymphocytes 26 per cent, large mononuclears 3 per cent, parasites nil. Widal reaction (done three times, last on 46th day from the onset) was negative.

Treatment.—Typhoid line. Drugs, feeds, etc., were given by the nasal route. In addition he was given penicillin 20,000 units intramuscularly

every 3 hours and cibazol 0.5 g. t.d.s.

The clinical diagnosis was one of typhoid fever with intense toxæmia. Absence of high temperature was due to the low condition of the patient. That Widal reaction did not become positive could be explained by the absence of development of agglutinins which in some cases takes a long time to appear. In this connection it may be pointed out that the Widal reaction in case no. 4 became positive on the 50th day. After five days of penicillin (800,000 units) and 7.5 g. cibazol the patient's condition showed remarkable improvement. The toxæmia

vanished, mind became clear and the convalescence was smooth.

Discussion

To draw general conclusions from only seven cases will be unwise. But the results of the present work supported by the observations of McSweeney (1946) and Basu (1947) would certainly make a cogent prima-facie case for recommending this new line of treatment for typhoid fever. None of the seven cases in the present series died although five of them were suffering from very severe infection of typhoid fever. It means that this line of treatment will greatly reduce the present mortality of typhoid fever.

One may be posed with a pertinent question and that is whether penicillin should be used alone or in combination with sulphathiazole. Basu (1947) observed that in five cases of his series after the first course of penicillin the general picture improved considerably and the temperature touched normal and remained so for a few hours but again went up when a second course was given. After the second course the infection was completely controlled. In his sixth case 60,000 units of penicillin were given every 3 hours and after 660,000 units there was perfect convalescence. His seventh case died. In the present series two cases (nos. 1 and 4) were treated with penicillin alone. To neither of them was a second course of penicillin given. This was because the drug was not available. It was concluded that penicillin when given alone reduces the toxemia and brings down the temperature although the latter goes up and persists for some time in a narrower range after stopping the penicillin. The clinical effects appear to confirm the laboratory findings of Evans (1946).

The results of combined treatment with penicillin and sulphathiazole were remarkable. Even the hypertoxic cases responded dramatically after 800,000 units of penicillin and 7.5 g. cibazol. Less severe cases needed smaller doses. All of them had smooth convalescence after only one course of penicillin-cibazol. McSweeney (1946) had to give two courses to each of his patients. But there was one advantage in children (in present series) which was that only one course terminated the infection in them. It was concluded that combined treatment of typhoid fever with penicillin and sulphathiazole was definitely superior to treatment with penicillin alone.

Summary

Seven cases of typhoid fever in children were treated with penicillin and sulphathiazole. Two were treated with penicillin alone and the rest with penicillin and sulphathiazole combined.

The results were very encouraging.

Acknowledgments

I wish to express my appreciation of the services of my house physician Dr. Sohan Lall Agarwal, M.B., B.S.

(Agra). My thanks are due to Dr. G. N. Vyas, M.D., MR.C.P., P.M.S., Principal, Medical College, Agra, for his kind permission to publish the case reports.

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FALSE POSITIVE SEROLOGIC REAC-TIONS FOR SYPHILIS IN EOSINOPHILIA

By BALBIR SINGH Main Hospital, Jamshedpur

Greval (1940) reported that some cases of . Eosinophilia 'give false positive Wassermann reaction. More recently Menon (1945) and D'Abrera and Stork (1946) reported similar reactions in tropical eosinophilia. It was proposed to record results of Wassermann reaction and Kahn test in all cases of eosinophilia as a part of the investigation into the incidence of false positive serologic reactions for syphilis in patients admitted to 50 Indian General Hospital in Ceylon Army Command,

(1945) and D'Abrera Comments.—Menon and Stork (1946) working on sera from cases of tropical eosinophilia reported false positive reactions in 80.0 per cent and 85.0 per cent respectively. In the present series there were five cases diagnosed as tropical eosinophilia.

Three (60.0 per cent) out of these five were sero-positive. Kahn verification tests performed in one of these three showed general biologic type of reaction. One (case no. 7 in table I) out of the other two who were seronegative had been treated with N.A.B. before the blood was tested for Wassermann reaction and Kahn tests. If this case is excluded we would have only one sero-negative case amongst

four cases of tropical eosinophilia.

False positive reactions in this series of 16 cases were 37.5 per cent and in them the eosinophils varied from 512 to 24,640. 3,780 was the lowest number of eosinophils associated with positive Wassermann reaction and/or Kahn test. There were only three cases with cosinophils below 3,780 in the series reported by Menon (1945) and D'Abrera and Stork (1946) and lowest number of eosinophils associated with false positive reactions in their series was 1,360. If this figure is taken as an arbitrary limit of eosinophilia below which false positive reactions

TABLE I

Seriai	Percentage of eosinophils	Absolute number of eosinophils	WR	Kahn	Clinical condition
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	8.0 9.0 12.0 15.0 11.0 21.0 16.0 18.0 28.0 20.0 63.0 58.0 64.0 22.0 31.0	512 516 1.152 1,170 1,188 2,104 3,360 3,780 4,154 4,656 4,720 14,049 14,500 24,640 Not recorded Not recorded	ии+++ин+ +ииииии	+ + + + + + + + + + + + + + + + + + +	Ascariasis. Ascariasis. No information available. No information available. No information available. Chronic bronchitis. Tropical eosinophilia. Information about clinical diagnosis not available. Gave no history of syphilis. No information available. No information available. Tropical eosinophilia. Tropical eosinophilia. Tropical eosinophilia. Tropical eosinophilia. No information available. No information available.

[•] WR = Wassermann reaction done by Wyler's modification—three-tube method—using, three and five times the minimum hæmolytic dose (M.H.D.) of complement in the test.

The standard Kahn test was performed and the results were recorded according to the procedure laid down by Kahn (1928) in 'The Kahn test'.

Only those cases that had no evidence of syphilis were included in this table and those that showed Wassermann reaction and/or Kahn test positive were tested a second time, 19 to 25 days after the first test, to confirm the reports.

are not likely to be encountered, incidence of cases showing serologic reactions in the writer's series of 11 cases (excluding five cases of eosinophilia below 1,360) is 54.5 per cent. If 11.3 [the percentage of cases with positive Wassermann

^{++ = 3} doses and five doses of complement fixed. +± = 3 doses fixed and five doses partially fixed. += 3 doses fixed and five doses not fixed.

⁼ Partial fixation of three doses only.

 $[\]overline{N} = Negative.$

reaction and/or Kahn tests amongst hospital population of the general wards during the same period—reported elsewhere by the writer (1947) in detail] is deducted from 54.5, the corrected percentage of cases showing false positive sero-

logic reactions comes to 43.2.

Wassermann reaction was positive (+, +± or ++) in five (83.3 per cent) out of the six cases that showed serologic reactions and was doubtful or ± in one (16.0 per cent) only. Kahn test, on the other hand, was positive in only one (16.0 per cent) of the six cases, doubtful in three (50.0 per cent) and was negative in two cases whose Wassermann reaction was ± and +± respectively. Only one case that showed ++ Wassermann reaction with +++ Kahn was very probably an old case of syphilis, though he gave no history. Kahn verification tests showed luctic type of reaction.

Combination of a positive Wassermann with a negative or a doubtful Kahn test was a characteristic feature of the serologic reactions. This finding was similar to that of Menon and D'Abrera and Stork in their studies of serologic reactions of cases of tropical eosinophilia.

Conclusions.—Tropical eosinophilia showed false positive serologic reactions for syphilis in more than 60.0 per cent cases. Combination of positive Wassermann reaction with negative or doubtful Kahn test was characteristic of these reactions. False positive reactions were not so often met with absolute number of eosinophils below 3,000, but these reactions were frequent with eosinophils above 4,000. Eosinophils below 16 per cent were not associated with false positive Wassermann reaction and/or Kahn test but they were very frequent when the percentage of eosinophils was above 30.

This opportunity is taken to thank Lieut.-Colonel A. C. Bhatara, I.M.S., Officer Commanding, 50, Indian General Hospital, Jemadar Jay Ram, I.A.M.C., v.c.o., and Sergeant Jansen of Ceylon Medical Corps.

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SHORT NOTES ON THE NORMAL BLOOD PRESSURE IN INDIAN FEMALES

By B. B. DOTTO

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Following the publication of several articles of mine during 1941-44 on various aspects of blood pressure in relation to life assurance, I have been requested by some medical men and

life assurance companies to prepare a blood pressure table for women, which can be used in practical assessment of risks. Accordingly a blood pressure table for women has been

prepared and reproduced hereafter.

Dr. Brandreth Symonds found the average diastolic and pulse pressures in European females between the ages of 15 and 70 years to be roughly about 126.1, 83.0 and 43.1 mm. Hg. respectively. According to the American experience the average systolic, diastolic and pulse pressures in American females were 124.6, 82.0 and 42.6 mm. Hg. Colonel Sir Ramnath Chopra records that the average systolic and diastolic pressures in Indian females on mixed diet were 115.4 and 70.2 mm. Hg. respectively, whereas those in vegetarians were 110.2 and 68.2 mm. Hg. respectively. I have found the average systolic, diastolic and pulse pressures in Indian females to be roughly 119.2, 78.2 and 41.0 mm. Hg. respectively.

Pressures were recorded during the hours of 2 p.m. to 5-30 p.m. (at least two hours after last meals), the first reading was checked by a second examination after an interval of 15 minutes' absolute rest; during the intervening time another lady was examined. To have accurate results it was ascertained before each recording that the lady was not in her 'period'

or 'carrying'.

Auscultatory methods were employed in recording the pressure, checking the results with palpatory method in case of slightest doubt. I have used a latest 'Kompak' model lifetime 'Baumanometer' generously placed at my disposal by the manufacturers, Messrs. W. A. Baum & Co., Inc., of New York. This small but perfect instrument has given highly satisfactory services under most trying conditions at times. The standard sleeve-band supplied with 'Baumanometer' was used. In some cases 'Accoson' armlet and 'Tycos' anatomical sleeve-band were also used.

About three years were taken to complete the observations of nearly 2,000 ladies and in compiling the results from jotted records. The ladies whose blood pressures have been recorded are from college and university students, school and college teachers, doctors, student nurses, staff nurses, A.N.S. and I.M.N.S. nurses, student health visitors, health visitors, air hostesses, stenographers, typists, telephone clerks, A.R.P. and W.A.C.(I.) personnel, comprising of Bengalis, Assamese, Biharis, Oriyas, Punjabis, Indian Christians. Mohammedans, Madrasis, Nepalis, Khasias, Anglo-Indians and Anglo-Burmans. 72.5 per cent of the ladies were single and only 7 per cent were vegetarians. I am greatly indebted to these ladies for their kind co-operation, without which it would have been impossible to prepare this table.

The users of this new table should not hesitate about the comparatively smaller number of entrants, which is 1,674. The Oriental Life

Assurance Company's blood pressure table has been prepared with 1,372 readings and Mr. Lewis P. Orr's British blood pressure table was prepared with only 1,444 entrants, but both these tables are very popular and extensively used.

Table of average arterial pressure in 1,674
Indian females

Age group	Number of entrants	Average systolic pressure	Average diastolic pressure	Average pulse pressure
17-19 20-24 25-29 30-34 35-39 40-44 45-49 50 and over.	90 512 310 216 272 150 S4 40	112.9	72.3 74.4 75.0 77.2 79.0 80.6 82.6 85.2	36.2 38.5 39.3 41.4 41.2 43.4 43.4 45.3

A NEW OPERATION FOR ENTROPION AND TRICHIASIS OF THE UPPER EYELIDS

By NAUMANN T. MASCATI, D.O.M.S. (Bom.)
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THERE have been many operations devised for the relief of these conditions and a few of them are ingenious. But the chief defect and disadvantage of many of them is the production of a post-operative ectropion and mutilation of the eyelids which is a very serious setback cosmetically. Moreover, the recurrence of the original condition is also quite frequent. It is not my idea in this paper to criticize other classical methods and to run them down, but these disadvantages are so prominent that their mention is in order. By following the new method to be described, the risk of a recurrence minimized and the resultant sears are undetectable. Again since there is little loss of tissues, the chances of ectropion are insignificant, almost nil.

As this is more or less plastic surgery, the cleanliness of the skin of the lids and the surrounding area is of utmost importance.

Pre-operative technique.—Wash the face thoroughly with soft soap and hot water. Dry with a towel. The usual anæsthetic for eye surgery having been instilled, the cornea, the bulbar and palpebral conjunctiva anæsthetized, the upper eyelid of the affected eye and the surrounding area is sterilized with gasolene and acriflavine in spirits. The former thoroughly cleanses the skin of the greasy material and sweaty matter wherein lies the chief danger of infection as the bacteria are harboured in this greasy matter. Moreover, gasolene is a powerful antiseptic. Acriflavine is highly efficient as an additional antiseptic, Great care should be

taken however that none of the antisepties gets into the eye at all. A clean and aseptic field is absolutely necessary for the success of the operation and for satisfactory results. This arbitrary choice of antiseptics is imposed because of their superiority over others and their uniform good results during the long experience of the author.

The head and face are then draped with sterile linen. Novocaine 2 per cent solution with adrenaline hydrochloride is injected into the upper lid, and as near the grey line as possible. It is also more convenient and of greater advantage to inject the solution in the palpebral conjunctiva of the upper cyclid at the superior fornix.

Operation.—The surgeon should study very carefully the arrangement of the displaced lashes and should keep in mind their position.

1. A scratch with a very sharp knife is made, parallel to the lid margin, slightly above the position of the hair follieles. The ends of the scratch should extend a little farther away than the last mal-placed hair on either side (figure 2). The scratch should be a very light one and should not go to the whole depth of the skin. It is meant only as a mark.

2. Another similar scratch is made parallel to, and just below it. This scratch goes right up to the subcutaneous tissue layer (figure 2).

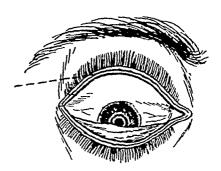


Fig. 1.—The diagram shows the upper and lower eyelids everted, exposing the grey line (indicated by the dotted line).

3. A third scratch is made parallel to, and above the first scratch, so as to include a strip of skin, the breadth of which should be about

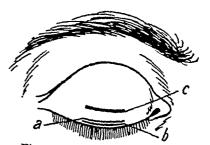


Fig. 2.—Diagram showing the three scratches:
a. First scratch.

b. Second scratch.

c. Third scratch.

2 mm. more than the distance between the first

scratch and the grey line (figure 2).

4. A fourth scratch now is made exactly on the grey line (figure 1), splitting it to the length of the first scratch (figure 3). Any bleeding which is caused can be promptly checked by pressure. An entropion clamp is useful. The knife used for splitting the grey line should be extra sharp. I use Làng's knife, originally used for splitting the cornea in sclerocorneal trephining.

A tunnel now is made through the splitted grey line, up to the first scratch, throughout the length of the scratch. This tunnel is freed of all adhesions by a blunt dissector which is in form of a flat narrow-bladed spatula. An iris repositor of the straight variety answers the purpose well. We may have to use the knife now and then during this tunnel making.

The next step is to free the strip of skin between the first and the third scratches. The detachment begins from the upper edge, right down to the first scratch, with small blunt pointed pair of seissors. The breadth of the skin strip is limited by the length of the scratch.

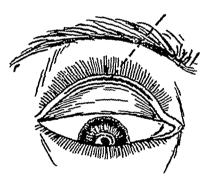


Fig. 3.—Diagram showing the fourth scratch at the grey line (indicated by the dotted line).

Two vertical scratches, one on either side, are made at the ends of the third scratch, extending to the corresponding ends of the first scratch (figure 4). Thus this strip is attached to the

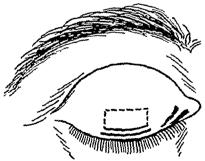


Fig. 4.—Diagram showing the scratches limiting the skin strip. The interrupted lines indicate the third scratch on top, and the two vertical lines indicate vertical scratches.

upper border of the first scratch, and is free from the lower border of the third scratch. Now the freed strip should be carefully prepared by doing away with the subcutaneous tissue on its under-surface. It is of advantage to prepare this strip as thin as possible. This done, scrape away nicely all epidermal tissue from the skin surface of the strip. Then pass two fine-pointed hooks (iris hooks are quite adequate) through the tunnel from the grey line upwards, one on each side-end of it, and bring them out in the wound on the skin surface of the lid. The two upper corners of the skin flap are caught in the

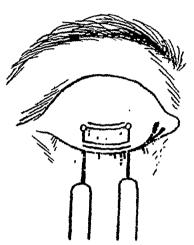


Fig. 5.—Diagram showing the detachment of the skin strip and passing of the two iris hooks at each end of the strip, to bring it down into the splitted grey line.

hooks (figure 5) and the upper border of the strip is tucked into the tunnel, and is drawn through the tunnel and brought out at the grey line (figure 6).

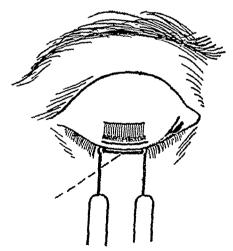


Fig. 6.—Diagram showing the drawn down skin strip into the intermarginal space, with the hooks still in position. The dotted line shows the edge of the trimmed skin strip.

The redundant skin from the strip, after careful apposition of it in the grey line, is trimmed off. A fine silk suture is passed at each end of the grey line, through the lid border, including with it both lips of the splitted grey line with the drawn-in skin strip. One more suture may be put in the middle if thought necessary (figure 7).

Now at the discretion of the surgeon, if he deems it fit, some tissue may be cut away, with a wedge-shaped piece of the tarsal cartilage, from the upper wound. This is nothing more than the usual step of the original operation for the correction of entropion, and is not at all necessary. After this the upper edge of the third scratch is sutured with fine continuous sutures to the lower edge of the second scratch.

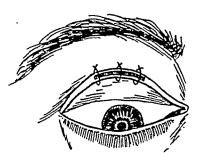
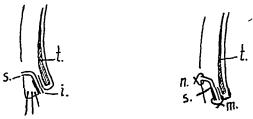


Fig. 7.—Diagram showing the three sutures placed on the splitted grey line containing now the skin strip between its lips.

I prefer personally to put in a subcuticular suture, using plain catgut no. 00. The eye is then bandaged, and sutures removed on the 5th post-operative day.



Figs. 8 and 9.—Diagrammatic sections of the upper cyclid, showing the skin flap in the tunnel in the intermarginal space:

- i. Intermarginal space.
- s. Skin flap in situ.n. Skin suture joining the third incision with the second.
- m. Suture joining the split intermarginal grey line, containing now the skin flap.
- t. Tarsus.

Summary.—The main idea of this method of correction of the entropion is twofold: (1) The minimum production of scar tissue and cicatrix. (2) The elevation of the zone of the mal-placed hair follicles with a pediculated skin flap. As can be seen from the technique there is no external wound uncovered by the skin, as is found in some methods of operation. In some, however, the transplantation of an excised piece of skin, in the laminæ of the split intermarginal line, is practised. But this has the disadvantage of being displaced by the bandaging of the eye, and also the perfect apposition of the lips of the wound is not assured.

The use of the continuous pedicle ensures the viability of the flap, and eliminates the

danger of necrosis. Again the shortening of the skin produced by drawing down the strip of the skin into the tunnel is not prone to stretching out again. Thus the fear of a relapse due to this factor is also remote. As the split intermarginal space contains only the border of the turned-in skin, between its laminæ, the eyeball is not exposed to any lanugo hair, as in Arlt's operation. Similarly, Van Millingen's method has the disadvantage of the shrinking of the mucous membrane graft.

In cases of trichiasis, with only a few cilia mal-placed, the same method may be followed on a smaller scale, to elevate the bed of the hair follicle, but here the sutures should be placed on the lid by appropriating the edges of the wound vertically although the scratches are made horizontally. This is made possible by the small length of the incisions.

In extreme cases of trichiasis and entropion, where it is many a time impossible to do excision of the skin, or when there has been a relapse after one of the operations, and there is a fear of ectropion or lagophthalmos, by any more shortening of the skin, the following method of 'Ablation of the zone of hair follicles' may be used with great advantage.

Prepare the eye for surgery, by anæsthesia and antiseptics, as described previously. Inject novocaine 2 per cent solution with adrenaline, under the lid margin, on the site of the bed of the hair follicles. Adjust an entropion clamp of Snellen's type, and make a scratch over the length of the skin of the eyelid, just over the hair follicles. Dissect down and expose the hair roots: Then with actual electro-cautery using a fine point, burn out all the hair roots. Now with a cilia forceps pluck out all the hair from the lid margin. Close the wound with sutures. In Flarer's method there is produced a raw surface which is allowed to heal by granulation thus creating the much-feared and unwanted cicatrization.

The simplicity of this procedure is quite appealing and the results are highly encouraging. There can never be any relapse, since nothing has been left. The permanent disfigurement, after removal of the cilia, is not so great; and even if it is there, a little more disfigurement does not count more, when the eyelid as it is, is so much disfigured by the disease itself. Again the patient, prior to coming over to the surgeon, is nearly in all the cases used to plucking out the irritating hair himself. Another objection to this method has been brought forward and that is that the eye is deprived of the protection the cilia afforded. But the cilia now are doing more harm than good to the eye. Once their arrangement is distorted they lose their importance and cease to be of any protection to the eye. In the end, I believe, that this method can replace the electrolysis whenever it is not possible to have the apparatus. The results are the same.

A Mirror of Hospital Practice

A CASE OF SPREADING PARALYSIS

By SAILESH CHANDRA DUTTA, L.M.P., D.T.M. (Cal.)

A.M.O., Itakhooli T. E., Tinsukia, Assam

A Hindu female labourer 35 years of age was carried to the hospital on 16th May, 1947, for inability to move the right leg and the right arm. She was fully conscious and described the onset of her paralysis as follows:—

She worked in the garden under the hot sun on the previous day but was not feeling well with her right lower limb. She felt in the periphery of the limb, tingling and numbness which gradually extended upwards. By the afternoon, she felt weakness of the same part and at night she was unable to move it. At the same time she experienced weakness of the right arm too and was afterwards unable to move it. She had no vertigo, no headache and no vomiting. She was a multipara, the age of the youngest issue being two years. There was no previous history of venereal disease or any other serious illness.

Clinical findings on admission:-

Intellectual functions—normal.

Cranial nerve functions—normal. No facial paralysis, no deafness, no Argyll-Robertson pupil, no nystagmus.

Motor functions—Complete flaceid paralysis of the right leg and paresis of the right arm.

Sensory functions—normal.

Reflexes—plantar reflex lost; abdominal reflexes lost; knee-jerk lost; sphincters normal; Kernig's sign negative.

Temperature (axillary) 98.6°F.

Pulse—88 per minute, respiration—26 per minute, bowels constipated, urine normal, blood film for malaria parasite negative. Hb value on Tallqvist scale 65 per cent.

There was no other abnormal finding.

Next day, the right arm of the patient got completely paralysed. Temperature rose up to 99°F, in the evening and this low irregular rise of temperature was found daily for the next ten days.

On the third day, paræsthesia of the right leg

and right arm was found.

On the seventh day, the temperature rose up to 101°F, and the bowels became very loose. Paresis and paræsthesia of the left leg was found. Blood was again negative for malaria

parasite.

On the ninth day, the temperature went up to 102°F. and paresis of the left arm developed. The patient complained of severe pain behind the neck affecting to some extent both the shoulders. The part was tender to touch. There was no pain on the limbs. The neck was rigid but Kernig's sign was negative. Lumbar puncture showed normal flow of clear C. S. fluid and

on microscopic examination, a few red cells were found.

The treatment so long given to the patient was purely symptomatic, but on the 11th day she was put on a 4 days' course of sulphadiazine (though empirically) making a total quantity of 21.5 grammes. From the 11th to the 20th day, her temperature was within normal limits. Pain behind the neck gradually subsided.

On the 21st day the temperature rose up to 100°F, and the right arm and the right leg got slightly edematous. The abdomen became tympanitic and the patient did not pass flatus or fæces for the next 24 hours. There was paralysis of abdominal muscles. There was retention of urine with overflow incontinence. The bladder had to be catheterized twice daily for some subsequent days.

On the 22nd day, the respiratory muscles became involved; she became very dyspnœic; both the lungs became congested; the temperature was of continuous type for the next 4 days, then became intermittent and ran for another ten days. Blood for malaria parasites was again

negative.

On the 23rd day, the respiratory difficulties and the congestion of lungs became less. The bowels could be moved by an enema. The abdominal paralysis was less.

On the 25th day, the patient could move the

left leg and next day the left arm.

On the 27th day, a few drops of pus came out after catheterization of the bladder and the temperature shot up to 104°F. A course of sulphonamide given at this stage failed to control the temperature.

On the 32nd day, during the second bout of pyrexia, it was found that the patient could move her right arm. The urinary sepsis persisted.

On the 34th day, she could move her right leg

slightly.

On the 35th day, a course of penicillin (which was not available to us earlier) was started and a total quantity of 525,000 units was given. The temperature settled down next day and remained normal. The patient could passurine voluntarily. The paralysis of all the parts affected began to improve rapidly and within next two weeks the last trace of paralysis cleared up. She could walk now with the help of a stick with unsteady gait obviously due to some spasticity of the lower limbs which also cleared up soon. On the 55th day, she could walk without the help of a stick. There was no bedsore or any other trophic changes during the whole stormy period of paralysis. The limbs were not wasted. There were no residual paralysis and deformity.

The patient was discharged cured on the 72nd day of her illness, and on enquiry after 3 months she was found working regularly in the garden.

The following facts are noteworthy in this

(a) An adult woman got a sudden attack of paralysis which was of a spreading type extending to different parts of the body in stages and attacking in this order: right lower limb, right arm, left lower limb, left arm, abdomen and thorax. The paralysis was of flaceid type with loss of all reflexes and was attended with fever.

(b) The paralysis was not strictly of an ascending type and the onset was not attended with severe sensory loss, loss of sphincter

control or unconsciousness.

(c) The patient made a complete recovery and there was no residual paralysis or deformity.

My thanks are due to my chief Dr. T. A. Cox for his valuable advice in the diagnosis and treatment of the case.

BRONCHIAL CARCINOMA SIMULATING PULMONARY TUBERCULOSIS

A REPORT OF TWO CASES

By I. UNGAR, M.D. (Vienna)

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The importance of x-ray examination in the diagnosis of pulmonary tuberculosis is rightly stressed. Shadows should however be interpreted consistently with clinical findings. Recently two cases came under our observation which illustrate this point:—

Case 1

P. D. P., 60 years old male, Christian, was admitted on the 19th February, 1947. He complained of pain in the right side of the chest, breathlessness and very troublesome cough with

blood-stained frothy expectoration.

History.—Pleurisy on the left side 40 years ago. Hæmoptysis one month before admission and slight pain on the right side of the chest which gradually increased and became rather severe so that he had to have morphia injections on several occasions. He also noticed a supraclavicular gland appearing on the right side. There had been an attack of rigor with temperature three months before admission lasting three days. His sputum was examined and found negative for tubercle bacilli by direct smear.

X-ray examination on the 16th January, 1947: 'Cloudy opacity of the right mid-zone and the medial part of the right upper lobe, right hilar shadow enlarged. Calcified lesions on the left side with evidence of old pleurisy' (figure

1, plate III).

Patient's son had been suffering from pulmonary tuberculosis and was an in-patient

of this sanatorium.

On admission.—Well built rather obese male of the pyknotic type. Breathless and having almost incessant cough.

Physical examination of the chest: Both

sides move equally.

Palpation: Apex beat 5th intercostal space in the mammary line. Solitary supra-clavicular gland palpable on the right side.

Percussion: Right supra and infra spinous areas dull.

Auscultation.—Bronchial breathing over the

same area, wheezing.

X-ray examination (this was done with the patient lying down): Homogeneous opacity of the upper half of the right lung, the density of which decreases towards the apex. An oblong dense shadow at the periphery of the mid-zone of the left lung and a solitary one of the same density in the apex. Costophrenic angle obtuse (figure 2, plate III).

Conclusion.—The process on the right side is considerably more extensive as compared with the photograph taken one month ago. The radiological findings on the left side are suggestive of old calcified pulmonary lesion.

Biopsy of the sub-clavicular gland was done on the 22nd February and the report of the pathologist was adenocarcinoma of bronchial origin. Repeated sputum examinations were negative for tubercle bacilli.

Patient left the sanatorium of his own accord on the 2nd March, and died at his home two

months later.

Comment.—History of previous pleurisy, the x-ray appearance as well as family history of pulmonary tuberculosis were strongly in favour of the diagnosis of tuberculosis. Clinical symptoms, absence of fever and copious frothy blood-stained sputum which was negative for tubercle bacilli made the diagnosis unlikely. Wheezing and breathlessness due to obstruction of a major bronchus is rare in adult pulmonary tuberculosis but common in malignant lung disease. Biopsy report settled the diagnosis.

Case 2

M. L., 45 years old Hindu male, was admitted on the 13th July, 1947. He complained of breathlessness and pain in the left chest.

History.—About three years ago he noted dry cough which was unproductive. A year before admission he started having recurrent attacks of breathlessness after every four or five days, which lasted about 15 minutes to half an hour. About May 1947 he had severe pain in the chest, and became breathless. He consulted a physician; x-ray was taken and the diagnosis, pleurisy with effusion, made. Fluid was aspirated on two occasions before admission but it did not appreciably relieve his breathlessness. He did not have any temperature during the course of the disease. He gave no history of contact of tuberculosis.

On admission.—Well-built male of about 45 to 50 years of age, obviously breathless and

slightly cyanotic.

Clinical examination revealed fluid in the left pleural cavity, with displacement of heart and mediastinum to the right. This was confirmed by x-ray also (figure 3, plate III). No other abnormality detected. Pleural fluid was aspirated and about 40 ounces of strongly bloodstained fluid was removed. Respiration remained

laboured though the rate was 24 per minute after aspiration. Fluid was again removed on the 4th day, but this as well as two more aspirations failed to relieve the subjective symptoms. The pleural cavity remained dry after the last aspiration. The temperature on admission was 102.2°F. It came down gradually to normal and remained so after the 7th day. Patient's condition became gradually worse, and he expired on the 16th day after admission.

Sputum examinations were negative for tubercle bacilli, and guinea-pig inoculation of the fluid also gave a negative result. Because of the apparent inconsistency of the clinical and pathological findings it was thought that the pleural effusion might be secondary to bronchial carcinoma. A specimen of fluid was therefore sent for histological examination. The report

read:

'The specimen was about 2 c.c. of blood-

stained fluid with a fibrin clot.

'Microscopy of the deposit showed almost all the cells to be red blood corpuscles with no more leucocytes than can be accounted for by the presence of blood. No cancer cells were seen.

'A preparation of the clot, however, shows several groups of spheroidal cells with large hyperchromatic nuclei, and a tendency to form a syncytium. These are probably cancer cells (figures 4 and 5, plate IV).

A Ziehl-Neelsen stain showed no tubercle

bacilli.

'Probably bronchogenic carcinoma of lung'.
Bronchoscopy could not be performed because

of the patient's precarious condition.

Comment.—Strongly sanguineous fluid is rarely found in tuberculous effusions. Because aspiration of fluid failed to relieve the patient's breathlessness, obstructive lung pathology was looked for. Bronchoscopy could not be done. Sellor Holmes states that it is possible to demonstrate cancer cells in pleural fluid when pleural seeding of a malignant growth occurs. The pathologist's finding and negative guineapig inoculation test made the diagnosis of bronchial carcinoma the most likely one.

I am indebted to Dr. O. C. Lloyd of the Central Research Institute, Kasauli, for examining the specimens.

The skiagrams are far from satisfactory.—Editor.

I.M.G.

CYSTIC DISEASE OF LUNG—A CASE REPORT

By P. L. DESHMUKH, M.D., D.T.M. & H., F.C.P.S.

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Interesting lung conditions are encountered while examining cases referred for pulmonary tuberculosis. Following is a case report of cystic disease of lung so discovered. Owing to the relative rarity of the condition and the confusion it causes in the diagnosis of pulmonary diseases I believe it deserves recording.

Case report

A male, aged 45 years, was referred for increasing weakness, anæmia and dyspnæa on exertion

of two months' duration. 'There was a history of contact with an open case of pulmonary tuberculosis three years ago. He had an attack of influenza two months back for a week. Later, fever and cough subsided and the complaints mentioned above gradually made their appearance. He had no history of any chronic respiratory disease. On examination, he was found to be well developed and well nourished but pale. Right side of the chest showed deficient movement, diminished V.F., impaired note and diminished air entry. Adventitious sounds were absent and trachea did not show any displacement. He had no cough or expectoration. His 24-hours' sputum was collected and examined for acid-fast bacilli by concentration method on three different occasions. The result was negative. His B.S.R. was 8 mm. at the end of one hour (Westergren). His temperature was normal. His blood examination showed:-

.. 3,860,000 cells per c.mm. Red blood cell count White blood cell count ... 4,800 76 per cent (Sahli) Hæmoglobin . . Differential count-Polymorphs 65 per cent Lymphocytes 30 . . Mononuclears ٠. ٠, ,, Eosinophils Kahn test Negative

The x-ray picture of his lungs showed honey-combed appearance in the lower two-thirds of the lung-field (see figure 1, plate IV). During the fifty days of observation and investigation he showed an increase of ten pounds in weight from 120 to 130 pounds. The condition was diagnosed as congenital cystic disease of lung. He was advised treatment for his anæmia and was told not to exert enough to get breathless

Primary cystic disease of lung is a congenital anomaly. Sellors (1938) considers that the ætiological factor lies in some developmental error of the bronchi. The lung parenchyma is replaced by multiple small cavities and the cystic area may sometimes appear to be separated from the healthy lung tissue by a well-defined fibrous wall. Echinococcal (hydatid) cysts and dermoids are not included in this term. There may sometimes be a single large cyst but more characteristically multiple small, cysts are found, giving the area of the lung a 'honeycombed' appearance. In this respect it resembles the polycystic disease of the kidney. The affection is often unilateral.

Two main groups of congenital cystic conditions are described, the one communicating with the bronchial tree and containing air, and the other shut off from the bronchial tree and containing secretion. No doubt, all cysts must communicate with the bronchi but the communication is very difficult to demonstrate in the latter group. In our case, bronchography could not be done; however, it appears to belong to the former group from the x-ray pictures taken

at different times.

PLATE III

BRONCHIAL CARCINOMA SIMULATING PULMONARY TUBERCULOSIS: I. UNGAR.

(M. H. P.) PAGE 83

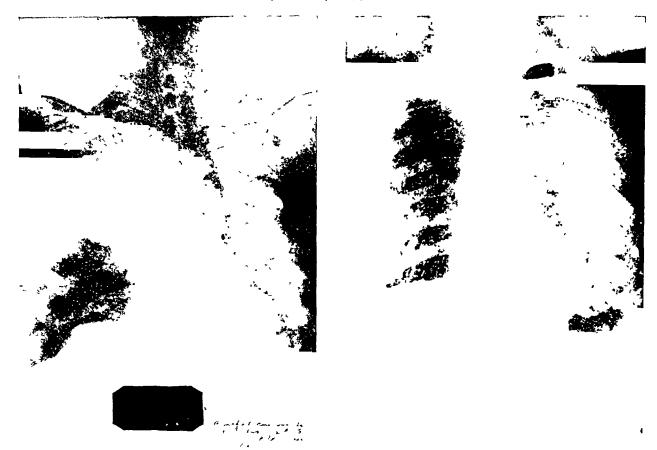


Fig. 1. Fig. 2.

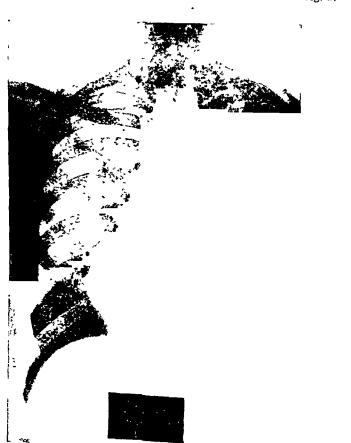
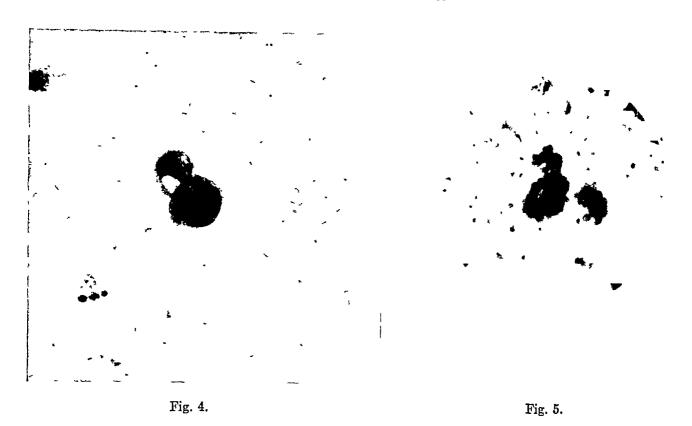


PLATE IV
BRONCHIAL CARCINOMA SIMULATING PULMONARY TUBERCULOSIS: I. UNGAR.
(M. Ĥ. P) PAGE 83



CYSTIC DISEASE OF LUNG-A CASE REPORT : P. L. DESHMUKH (M. H. P.) PAGE 84



rest

Lungs may develop cysts as an acquired condition. In this group may be included hydatid cysts, pneumatoceles, and cyst-like appearances that may be associated with respiratory infections, chronic bronchitis, emphysema and bronchial asthma. Lesions causing incomplete bronchial obstruction can produce similar conditions (Klosk et al., 1946).

Usually congenital cystic disease gives rise to no symptoms. The condition may be detected accidentally during fluoroscopy, or respiratory tract infection may bring it into prominence as, we believe, occurred in our case. In later life the case may present for diagnosis for increasing dyspnæa and may be detected radiologically

when under investigation.

Hæmorrhage, spontaneous pneumo- and hæmothorax are the complications that may commonly

end the picture.

Unless this condition is remembered while diagnosing pulmonary lesions, cystic disease of lung is likely to be clinically mistaken for chronic tuberculosis, pneumothorax, pleural effusion, diaphragmatic hernia, and pulmonary fibrosis. Hennell (1936) has pointed out that a commonly associated condition is a pneumonitis, and a greater or smaller degree of fibrosis is always present in the acquired form.

Excision of the lung or the lobe involved in the cystic process is the only curative treatment for the condition. Lobectomy (Hoyer and Clagett, 1946) and pneumonectomy (Gross, 1946) have been reported with success. Where the radical treatment is not possible, the patient should be advised to live within the limits of the ventilating capacity of the pulmonary tissue and to avoid infection of the respiratory tract.

Summary

A case of congenital cystic disease of the lung is reported. General information about the condition is given from the available literature.

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Tubercle, 20, 49, 114.

Therapeutic Notes

NOTES ON SOME REMEDIES XVII.-DRUGS IN ANÆMIAS

By R. N. CHAUDHURI, M.B. (Cal.), M.R.C.P. (Edin.), T.D.D. (Wales)

I. IRON

Iron is an essential constituent of the human body, and when it is deficient, either from insufficient intake or loss of blood, a type of anæmia develops in which the hæmoglobin of red cells is much reduced and which can be

cured by giving iron. Taken by mouth, it undergoes some changes in the stomach through the action of hydrochloric acid of the gastric juice and then passes into duodenum from which it is absorbed after some further changes brought about by bile. As McCance and Widdowson have pointed out, the absorption of iron is proportional to the needs of the body. In a normal healthy person with ample iron reserves there is very little absorption, though this can appreciably be increased by giving very large amounts. Healthy women and children, on the other hand, absorb iron readily-women owing to menstrual loss or needs of pregnancy, and children owing to growth requirements. Similarly, there is need for a positive balance of absorption in iron deficiency anemias. Once absorbed, iron is conserved to a remarkable degree; it is not excreted in significant amounts and even the iron derived from the breakdown of the effete red blood cells is stored up in the body. After absorption it is transported in the plasma and taken up by the developing red corpuscle in the bone marrow and goes to the formation of hæmoglobin. The greater part of iron is stored up in the internal organs, especially the liver. It is important to remember that in anæmic states the stored iron may remain immobilized or the plasma iron may not be utilized unless it is raised above the ordinary physiological level ('threshold phenomenon'), hence much larger doses are required to obtain optimum results than was formerly believed.

Choice of preparations

Iron is given in ferrous and ferric forms. The best preparations are ferrous salts, being better absorbed and utilized. Organic iron combinations cannot be recommended, as they are inadequate from the point of view of iron content besides being expensive. Nor is it desirable to use blunderbuss hæmatinic pills containing iron, liver, vitamins, etc.; they are less efficient and have no scientific value. For relative potency the preparations may be placed in the following order: ferrous salts, scale preparations, ferric salts and organic compounds; but for all practical purposes the choice should be between ferrous sulphate or carbonate and ferri et ammon citras. doses are given in the table.

It should be noted that ferrous sulphate is best given in tablet form (coated tablets, usually 3 grains, are available and very convenient), as in mixtures it tends to become oxidized to a ferric chloride and therefore less active. Ferri et ammon citras is stable in solution and can be used when a mixture is desired or in the rare cases when ferrous sulphate causes digestive disturbances. It is not astringent like other ferric salts. Blaud's pills should be freshly prepared, otherwise the iron becomes oxidized, and the pills may become so hard that it is passed unaltered in the stools.

Doses of iron preparations

, and proparations				
Drug	Daily doses	Remarks		
Ferrous sulphate	9–18 gr.	Best given in tablet form (3 gr.), 1 or 2 t.i.d.		
Ferri et ammon citras.	60–90 "	When a mixture is desired. Dose can be raised to 120 gr. a day.		
Ferrous carbonate pills (Blaud's pill).	60-90 "	Should be freshly prepared.		
Ferri carb. saccharatus.	60-90 ,,	Can be taken when other preparations produce dyspertic symptoms.		

- N.B.—(1) Small divided doses help in greater utilization.
 - (2) Doses need be larger in the presence of infection and chronic septic foci.

Iron should always be taken after meals and followed by a drink of water. This reduces its irritating effects on the gastric mucosa. The dose should be gradually increased in order to avoid digestive disturbances. Even after the hæmoglobin content becomes normal, iron should be continued a little longer, depending on the initial blood level. The usual course is 3 weeks which is repeated, if necessary, after an interval.

Iron by injection

When iron is injected, all the injected iron is retained and none is excreted. But although the B.P. contains an injection of iron consisting of iron and ammonium citras for intramuscular injection in doses of 15 to 30 minims, its use is not justified, as the amount of iron contained in it is too small to have any marked effect on the formation of hæmoglobin. Injection of larger doses produces disagreeable symptoms including palpitation, precordial discomfort, nausea and vomiting.

Iron poisoning

Although general intoxication due to orally administered iron is almost unknown, a few cases of fatal poisoning have been reported in little children who had swallowed a large number of tablets of ferrous sulphate, probably mistaken for sweets. Doctors should therefore warn parents that the tablets must be kept out of reach and are dangerous to children. Symptoms of encephalopathy were temporarily noticed in an adult patient by the writer.

II. LIVER

Raw liver contains a substance known as hæmopoietic or anti-anæmic principle which in a normal person is produced as the result of proper digestion and assimilation of an ordinary diet. This is brought about by the interaction between an extrinsic factor contained in our food and an intrinsic factor which is present in normal gastric juices. The hæmopoietic principle is then absorbed from the intestine, stored in the liver and supplied as required. It is essential for the proper maturation of the red cells in the bone marrow, and if it is absent as

in pernicious anæmia, their development becomes disordered and megaloblastic changes occur, characterized by the appearance of megaloblasts and macrocytes. The deficiency can be made good by giving liver. Minot and Murphy first discovered in 1926 the curative property of raw liver in pernicious anæmia and since then many crude and highly purified extracts have been prepared with more or less potent action on most macrocytic anæmias.

Liver can be administered in the following ways:

1. By mouth.—(a) Whole gland, lightly cooked.

Dose $\frac{1}{2}$ to 1 pound a day until the blood count is normal; at the beginning, 1 pound a day is required. Maintenance dose is 2 to 4 pounds a week. Although now seldom used, whole liver has the advantage that it supplies rich stores of vitamins B_1 and B_2 complex, iron and aminoacids of high biological value.

(b) Liver extracts, fluid or solid. The B.P. contains an ext. hepatis siccum (dose 10 gm. daily) and ext. hepatis liq. (dose 1 fl. oz. daily). These doses correspond to $\frac{1}{2}$ lb. of raw liver. Maintenance dose per week varies from 4 to 16 doses. Commercial preparations of both kinds are available.

(c) Proteolysed liver (e.g. 'Hepamino'). It is a fat-free papain digest of fresh liver, consisting of a powder easily soluble in water. Dose ½ oz. or more thrice daily. It contains some as yet undiscovered hæmatinic principle which is destroyed or removed during the chemical preparation of parenteral liver extracts, hence it is useful in cases complicated by other deficiencies and should be given when a megalocytic anæmia fails to respond to parenteral liver. It is often most effective in so-called refractory megalocytic anæmia.

Intramuscular. Parenteral method.—(a) As most patients soon get tired of whole liver and cannot continue it for long and as extracts cannot always be relied upon, by mouth administration has now parenteral replaced oral therapy. It is more efficient; has rapid effect in urgent cases and simplifies the problem of maintenance dose. Both crude and highly purified extracts are available; the latter are especially useful for the classical type of pernicious anæmia but often less efficacious than the cruder preparations when used in the treatment of other megalocytic anæmia, such as tropical nutritional anæmia. Some also believe that the crude ones are more effective against Purification causes neurological involvements. removal of certain factors which are sometimes essential for treatment. There are a large number of preparations on the market which provide the physician with a wide range of choice. Only extracts from reliable firms should be used and their action must be carefully controlled by blood examinations. Among the commonly used preparations may be mentioned Campolon (Bayer), Hepastab (Boots), Hepatex

I.M. (Evans), Anahæmin (B.D.H.) and Examen (Glaxo), or liver extracts of Eli Lilly, T. C. F., Lederle, Parke Davis, and Abbott. If a certain brand does not produce the expected response within two weeks, it should be changed for another. The dosage of such preparations varies with the concentration of the particular extract and it is best to follow the instructions recommended by the manufacturers with such modifications as may be necessary. A few c.c. of the extract are injected at first daily and then at longer intervals until the blood count is normal. A common practice is to give 4 c.c. of crude preparation daily during the first week, on alternate days during the second week and then at longer intervals, e.g. biweekly. The reticulocyte response occurs between the 4th to 10th day of treatment. In the presence of sepsis or arteriosclerosis larger doses have to be given; it is desirable to remove the septic focus. A maintenance dose is necessary in pernicious anæmia. It varies in different individuals and has to be regulated by periodical blood counts. It should be noted that during liver treatment the leucocytes often increase in number.

(b) Intravenous. This method gives more rapid action but is seldom necessary except in the very severe relapse stage of pernicious anæmia in which the patient is critically ill with the red cells below 1 million per c.mm. Five c.c. of a liver extract specially prepared for intravenous injection (c.g. Hepatex, P.A.F.) diluted in 20 c.c. of warm normal saline is given for one or two days. This is followed by intra-

muscular preparations.

Reactions to liver injections

There may be local pain and febrile reaction lasting for a few days. After receiving several injections the patient may very occasionally become more or less sensitive and react to further injections. The symptoms usually develop a few minutes after the injection and may range from the common, mild and transient urticarial or asthmatic manifestations to the more severe or even fatal anaphylactic shock. Adrenaline shouldbe given at the first sign of an attack. Changing the brand of liver extract sometimes suffices eliminate these reactions, otherwise the patient may be desensitized, or it is best to treat these patients with folic acid, liver extract or hog's stomach preparations by mouth. The reactions are more common after the intravenous injections which should be avoided in patients with allergic history.

Occasional Notes

SEX NEUROSES

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While psycho-somatic disorders have become common in the present life of economic and social distress in India, sex neuroses are not

lagging behind and have grown important enough to warrant a separate class for themselves.

The manifestations of these neuroses are :-

I. In males:

Ejaculatio-præcox.
 Imperfect erection.

(3) Impotence which may be (a) to all females or (b) to one particular female.

(4) Hysterical fits and anxiety reaction.

(5) Obsessive-compulsive neuroses.II. In females:

(1) Dyspareunia.

(2) Frigidity.

(3) Vaginismus.

(4) Pain in the back.

(5) Pelvic pain.

(6) Dysmenorrhæa.(7) Phantom pregnancy.

(8) Hysterical fits and anxiety reaction.

The methods of their production and treatment differ fairly widely from those recognized in western countries. The social and sex life of our country is essentially different from that of the West. There is no free mixing of the members of the two opposite sexes specially during the pre-marriage stage of life; picnics, boating, dances and outings of such pairs are entirely disallowed. Our moral laws, social bindings and lack of sex education in early youth always give the individual an outlook of awe and unexplored curiosity of sex life. There is at present a peculiar mixture of the sanctity and the sentimental moral life of ancient Hindusthan and the modernism of the West. The result is a partial freedom of the members of the two sexes, yet there is a constant fear of bad reputation and of social and moral crime. The criticisms and remarks of friends and others. certain misleading advertisements and reading of cheap literature on 'crimes of sex all are a constant menace in the conscious and subconscious mind of the developing youth. Those falling victims to much mental conflicts are liable to be swept away into the realm of neuroses.

In males

In males the symptoms may manifest them-

selves in a variety of ways,-

1. The bad psychological effects of masturbation and nocturnal emissions are well known. Masturbation starts as an outlet for the sexinstinct and as a means of dissipation and release of the mental sex-tension. It has no harmful effects so long as it remains at that level. Unfortunately in a large number of youths it goes beyond this harmless stage; religious literature and advertisements of various drugs to overcome the imaginary weaknesses and impotence are read and re-read. 'Friends' of the masturbation circle of boys bring such pamphlets and advertisements and news that other men had failed in their marital

life as a result of masturbation. Fear creeps in and mental tension remains high. vicious circle is produced—the more the nervousness and the mental tension, the more the frequency of nocturnal emissions and this is followed by more fear of its bad effects on sex vitality. This vicious circle may have a happy ending in most men by wiser counsel, access to the opposite sex or marriage. Others fall a victim to neuroses. The fear of sex weakness continues and on the first sex approach it is not uncommon to get premature ejaculation. This makes them still more nervous and convinced of their inability to do the act successfully. Cases are occasionally seen who experiment with public women before marriage and fail in their attempt and pass on to a worse mental state than before.

These types of cases no doubt form a common type of neurosis among the medical out-patients. One young man went a stage further. He felt convinced that he had become impotent as a result of masturbation and nocturnal emissions, the more so as his first illegal attempts at sex was met with premature ejaculation. The question of his marriage was brought up by his parents, which he totally refused. Finding no reason to satisfy his parents for refusing marriage the defence mechanism of his subconscious mind came into play and the youth started getting hysterical fits with unconsciousness, throwing about of limbs and foam from mouth, thus trying to simulate epileptic fits. This provided an easy argument for his uneducated parents to drop the problem of his marriage till he got well. The attacks came on more frequently whenever the question of his marriage was brought up.

2. Occasional cases do come of shy ignorant nervous young men who have absolutely no idea of marital or sex life and who have had hasty ejaculation on their first venture. If the spouse happens to be of a dominating or 'advanced' type who shows aversion or dislike towards the man for his weakness, a permanent nervousness follows leading to still further disability. The man then avoids any further attempts at consummation of marriage and goes about running to doctors.

to doctors. As with all other neuroses the proper understanding of these sex neuroses takes time and more than one or two sittings of a sympathetic and friendly talk are required to elicit full assurance Treatment is information. reassurance with a regulation of his mental life. It is wrong to tell him that he is all right and nothing serious exists with him or that the disease is entirely mental. An average Indian patient is not prepared to accept such assurances. He believes that his nervous system is weak, that his sex faculties are below par or exhausted and that he needs rejuvenation. An average patient is not educated enough to understand the real cause of his disability. He has to be told that he has a definite disease, a weakness, but that it is quite common and invariably amenable to

treatment, if he sticks properly to it and that this treatment is sure and infallible. As he knows that his disease is old-standing, he thinks that some long time must be required for the cure. A period of six weeks in an average case or ten weeks in a severer one is a good time to offer. A strict regime has to be prescribed. No sexual attempt for this period is allowed. The patient is asked to avoid meat, spices, hot foods and drinks. He is to avoid any food two hours prior to retiring to bed at night. He is asked to empty his bladder as the last thing at night and to take about half a tumblerful of water before retiring to bed. A good nutritious bland diet is recommended. He has to avoid all sex literature, advertisements and ideas pertaining to sex-tension. Drugs are similarly essential. Small doses of nerve sedatives are given, the last dose at bedtime. There is nothing that we cannot prescribe in this connection and anything is good enough whether vitamin B. calcibronat or even aqua distillata. The sex neurotics among the educated are very careful of every grain of drug they use. With this idea I have seen good success among such a class by using sex hormones—given not for their therapeutic value but for their psychological value. When a box is opened, care should be taken to hand over to the patient the box with the remaining ampoules and literature so that he can go home and read it well and derive the benefit from it as well as to feel all the time that he is being given the all powerful sex-hormones. Even the uneducated class will consult their friends to read this literature and tell them the use of the drug. After the fixed period of six or ten weeks the patient proceeds with his first attempt and this is an important event. In addition to the usual doses of sedatives he is instructed to take a double dose of his mixture (usually bromides and valerian) half an hour before the sexual act. This is just to avoid over-excitation. The report given to me next morning has mostly been 'I was successful, but not quite'. The ejaculation was still a bit too early—but that is natural. Repetitions after three or four days' gap are met with success.

3. Past unhappy experience may be the root cause of neurosis. The case quoted now is self-explanatory. A very shy, simple and healthy bachelor house-officer once went out with a female friend for his first venture. He was a type of man who is always nervous and careful to avoid any remarks on his character. Next day a rumour went round originating from a friend of the woman concerned that Dr. X was impotent. Some one made fun of the doctor by breaking him the news and one could certainly see a momentary paling of his face. A few months only were left of his forthcoming marriage and his friends observed a depressed way of his life during this period in place of the usual enthusiasm. He got married, stayed a week with his wife and returned to

the hospital without any attempt at consummation of marriage. He stopped replying to letters of his wife, could hardly eat anything, had no sleep and was heading for a welldeveloped neurosis. At this stage he was treated by assurance and being an intelligent man and above all a doctor he could be convinced with a full explanation of his mental conflict. His symptoms were discussed and by showing him how they arose as emotional reactions and by proving that they were retained because they were misinterpreted by him and by persuading him to see their real value, a perfect cure resulted. It is now over two years that he has had an ideal married life with a son as well. I am inclined to feel that more than his unsuccessful attempt with the female friend was the rumour of his disability which had produced the neurosis.

4. Quite often cases of impotence developing after a few years of married life are seen. It is quite interesting to note that they had four, five or even ten years of normality when suddenly they noticed sex weakness and finally impotence. A common cause of such a weakness is falling in love with another woman or removal of such an object to inaccessible quarters. A village youth attended the hospital with the complaint of impotence for the last three years, though he had been married seven years back and had four years of normal marital life. Interrogations finally revealed that he was in illicit love with another girl in the village and carried on with her as well as with his wife. After her marriage she left the village and went to her husband. Since that time this man has felt imperfect erection leading to total impotence. He was a difficult case to treat and stopped coming to the hospital after a few days.

Just the other way it may be true, a wife falling in love with another man and the husband getting the idea that he is not able to satisfy her instincts. She may threaten to leave the husband or refuse to come to him from her parent's house. This makes him more and more sexually depressed. I have recently seen one such patient coming from a village, impotence developing two years after his successful married life.

5. A large number of children with economic distress and meagre means may be the cause of such neurosis, the immediate precipitating factor being the loss of job, loss of money or a sad event in the family. Majority of people in our country do not venture to use contraceptives owing to ignorance, shyness in consulting a doctor or purchasing one from the market. One petty clerk in an office was a victim of such a neurosis. He had six children with a family income of Rs. 40 per month which too he had to forego for one month being on medical leave for some other illness. His impotence was a defence reaction of the subconscious mind to avoid any further children. Assurance, rest,

sedatives and provision of a contraceptive entirely cured him of his disability.

6. Exhaustion impotence.—Sexual excesses would be followed by temporary exhaustion in most normal people but if perchance neurosis is superimposed, the psychological impotence goes on. A well-educated and well-placed young man of 24 once complained of such an impotence. His story was that he had always boasted of his great vitality and was praised as such by many girls before marriage. After his marriage he indulged in excesses leading to exhaustion within a week. Being a newly-married man he felt shy of his wife at nights after this week and grafted a neurosis on top of his exhaustion. He sent his wife away temporarily and went from one doctor to another in search of a rejuvenating drug. In a few weeks he tried again on a public woman before he could venture to call his wife home, but failed miserably. This made him still worse mentally and desperate to the extent of offering half his wealth in exchange for his former health. Being a welleducated man he could be made to understand the cause of his illness and a six weeks' routine treatment gave him a new life.

7. Unnatural sex relations and perversions prior to marriage may produce a dislike for the opposite sex and failure to consummate marriage.

This is exceptionally rare.

8. Rarely one may come across obsessive-compulsive neuroses:—

(i) The idea and fear of moral guilt after masturbation may lead to a frequent handwashing complex.

(ii) Syphilophobia, i.e. patient may have groundless fear of syphilitic infection after an

illicit connection.

(iii) Sexual obsessions of continually repeating to themselves obscene expressions or of fear that they might repeat them in public, may exist.

In females

In females the symptoms are manifestations of mental conflict arising out of any of the

following factors:—

1. They may be the result of mental conflict between what a girl has seen and heard during infancy, early childhood and adolescence and her sense of duty to get married and devotion to the husband. She has seen the family discord. daily quarrels between her parents or between her brother and his wife, or in the family of any of her near relations. Such unhappy events in Indian homes are by no means uncommon. The girl has grown up all along getting a deep impression in her subconscious mind of the horrors of married life. Early impressions on the human mind are always more lasting and important than the later events. She gets married because she has to be married and she carries with her this mental attitude of abhorrence and hatred. If perchance she happens to get harsh treatment from her mother-in-law or indifferent

treatment from her husband it is quite easy for her to start with any of the neuroses which, if not suppressed at an early stage, will produce a complete picture of neurosis.

2. 'Jyotishis' or fortune-tellers and prophecies have a very important effect on our social life. Prophecies of impending widowhood, unhappy marital life or of separation make a deep impression on the mind and lead to mental conflict later on.

A young girl of 19 fainted at the time of her marriage and ever since started getting hysterical fits repeatedly. Dyspareunia was complained of when approached by the husband.

The history revealed that when she was a girl of 10 her parents were told by a 'Jyotishi' that she would be a widow at a young age. She somehow managed to hear the whispers in the family and was all along against marriage. But she was engaged and married as every Hindu girl must be. She showed a complete dislike for dresses, ornaments, pomp and ceremonials of marriage and started getting hysterical fits as the time of marriage approached; this was obviously a defence mechanism of the subconscious mind to avoid the marriage. Forced to marry she was afraid of consummation of marriage. She argued if widowhood is certain, why get a child as well to look after? Hence the dyspareunia. The treatment was not easy. Her educated husband was advised to follow the following plan: He was to look morose and depressed at nights, which he did. The wife naturally got perturbed and asked the reason for such a depression. The answer which he was advised to give was that the pleasure of this married life was short, that his wife was so nice yet he would have to part from her as in his horoscope it was written that he would be married twice. This behaviour and news from the husband ended her disease, as her mental conflict of widowhood was not tenable with the double marriage of her husband. Ever since she has had a very happy married life. The treatment had a very dramatic and quick result curing the disease almost overnight.

- 3. In the 'modern' girl repeated sexual excitation short of intercourse is often a cause of symptoms of neurosis.
- 4. Unsatisfied sex instinct when for any reason the husband is not 'retentive' enough or hasty in the act without regard to the orgasm of the female is often the starting point of manifestations of neurosis.
- 5. Lesbian love with a friend in early youth has been known in a girl of high-class family to be the cause of refusal of marriage. She showed manifestations of hysteria every time any attempt for her marriage was made since this would remove her from her object of the unnatural love.
- 6. Dysmenorrhœa nowadays is considered a functional disease in the vast majority. At puberty in a middle-class family the mother and

other elderly ladies show an undue anxiety for the onset of the menstruation. The girl is impressed that this is a great event in her life, that she must resort to complete physical rest in bed and avoid any exertion whatsoever, avoid slight chills, etc., and that slight cessation, delay or irregularity may mean a serious defect with horrible results. This leads to fear with the approach of each subsequent period. Dysmenorrhæa of this functional origin is unknown among the poor labouring classes and exists in middle- and upper-class families only, for obvious reasons.

- 7. Fear of pregnancy.—Coitus interruptus is not much practised in our country. Westerners have reported cases of dyspareunia in those who practise it. Severe pain is noticed towards the end of the act replacing the orgasm. This is a defence reaction to avoid any chance of pregnancy being a result of watchful anxiety at a time when normally one should be free from care of any kind. Use of contraceptives gradually cures this condition.
- 8. Acute pelvic pain has been described in women. Fairly large numbers of females do not experience sexual satisfaction in their marital life and they only think of sex as a sacred, unpleasant or at least indifferent duty towards their husbands, which they must perform with good grace. They do not know if any pleasure can be derived out of sex. Acute pelvic pain or pain in the back has been known to start. This is a defence reaction of the patient to avoid indifferent or unpleasant intimacy with the husband. Patients have been operated on for minor uterine troubles and deformities with no relief to pain, as the real cause was functional in origin.
- 9. In women over-anxious to have a child, all symptoms of pregnancy and even phantom tumour have been known to exist. It is too well known to need any special mention.

The above observations on these neuroses go to indicate that a medical practitioner has to be cautious not to miss the real cause of the disease. The frequency of these neuroses is very high, in fact, most of the functional disorders in young people are on further investigation found to arise from mental conflicts pertaining to sex. Often young educated neurotics or students attending the medical out-patients are seen to hide their real weakness under pretext of 'I am growing weak, I find ants crawling on to my urine in the bathroom', etc., and ask for a 'general tonic' for strength and will admit their sex difficulty only on careful interrogation. Despite all the moral standards of our country almost all of these youths come after a few trials and failures or partial failures on sex approach. As I have said above the sex neuroses are frequent and important enough in our country (in contrast to the West) to be placed in a separate class by themselves rather than given a minor place under hysteria or anxiety reaction.

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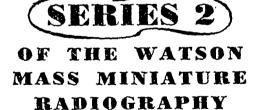
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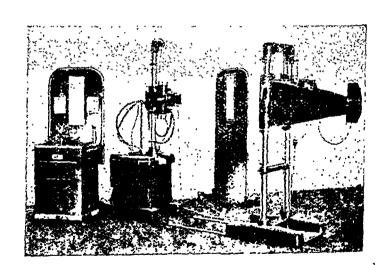
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* Report of the Committee on Tuberculosis in Wartime. Special Report Series 251. H.M. Stationery Office.

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Indian Medical Gazette

FEBRUARY

INTERNATIONAL ENEMY NO. 1: HURRY

This common enemy of the entire human race so far has claimed more success in the West than in the East. Once upon a time said a guide who had rushed an oriental potentate over half of New York in half a day, in all manner of transports, over all manner of ways, by all manner of devices for rising and falling:

Your Highness we have saved half an hour. Asked His Highness:

Having saved half an hour, will you please let me know what you propose to do with it?

The fell enemy, however, is now overpowering the East too, steadily, unremittingly and mercilessly, aided by a host of fifth columnists. The latter consist of imitating apes of means, merchants dealing in motor cars, owners of air lines, and smaller fry like newspaper boys and railway porters.

Rushing round of people wearing collars and ties or carrying dainty handbags is pathetic. They must go to several clubs every evening even for a mild daily inebriation. Once a week for greater loss of consciousness they must run round in their cars for a whole night, and knock down pedestrians and even policemen. Their real trouble is restlessness born of some repression or other in the rather rapidly changing environment after the First World War. They would benefit by psychogopalysis

They would benefit by psychoanalysis.

The pictorial news of speed trials at Daytona, after the First World War, made the world speed minded. In the first post-war depression the capitalists exploited the idea for keeping labour amused and contented (with the addition of the dole). They lionized speed makers, gave them fabulous wealth in prizes and raised them to knighthood. The 'bread and circus' of the last days of the crumbling Roman Empire were made use of again by another empire!

The infection spread to the East. Ordinary motor cars have begun to look like those designed for speed. They are streamlined but the shape serves no useful purpose. The speed allowed in towns does not need any modification in shape. They are made low so that they may go gripping the ground. The speed allowed, again, does not need such a particular grip on the ground. If they are taken out of town their low bottoms are likely to be ripped open by stones and brickbats which carters are in the habit of leaving behind. In the low-lying parts

of a town water enters their engines during a heavy shower of rain, even in the garage. Their low seats sloping behind to the level of the floor of the car thrust one's knees into one's chin. A well-nourished man becomes severely embarrassed with respect to his abdominal cavity even on an empty stomach: after a meal he runs risks of serious consequences. Their abnormal length is not only unnecessary but a public nuisance. The speed allowed or even possible does not need the length as a steadying factor. In turning they hold up traffic over longer stretches of road and for longer periods than do cars of ordinary length. One wonders why they are not taxed specially to pay for extra traffic police. The 'one piece' body of such cars with roof touching one's head is like an oven in the middle of the day. The total metal used in such a body is actually less than in the old-fashioned body of an oldfashioned and comfortable car. Yet the price is comparatively more. The tragedy is that this price is paid willingly because of the craze for speed or even the semblance of speed!

Air travel has its place in the modern world and in India of to-day. Without it our leaders could not have accomplished so much since 15th August, 1947. Ordinary citizens, however, can do without it easily. In fact, unless the cloth situation, hotel accommodation and laundry facilities return to their pre-war level, or at least improve considerably, air travel creates more problems than it solves as far as one's personal comfort is concerned. The craze for speed is

one of the problems.

One act of hurry leads to another. This sequence of events is exploited by London newspaper boys who run to sell their papers. The railway porters do likewise to create confusion and make passengers lose things at the termination of their journey. The situation was specially comic at European ports in times of perfect peace. Passengers with reserved berths in boat trains found themselves thrown into disorder and had to tip liberally to have their kit moved. Yet, if one waited one never lost one's berth or one's kit. The boat trains always waited until every reserved berth was occupied.

The newspaper boys cannot run in all parts of India in all weathers and have modified the technique of their European opposite numbers. They transform the energy into an assault and thrust their bundle of papers into one's face regardless of whether one is hailing a taxi, watching an approaching tramcar, bus or train, or talking to one's friend. By the time one has time to retaliate they have disappeared. The railway porters have also modified the techniques of their European opposite numbers. They, greatly outnumbering the packages to be carried, descend upon the passenger quickly and start a war of words among themselves. The fast stream of words, intelligible or unintelligible, sets the pace and the rest follows.

That the expectation of life has increased after the First World War and is likely to increase

further when things have settled down again, after the Second World War, is common knowledge. So far as human attainments are concerned there should be less need for hurry, not more, than there was in 1914. Human needs too should be satisfied in less time than before because of development in machinery. Rushing round for most people only satisfies a craze and. what is worse, destroys leisure and its broadening influence on the mind. It is quite capable of reducing the intelligence quotient of a nation in time. It is an atavism reverting one to

nomadic life when man collected food instead of growing it.

The expectation of life would rise further still if man did not wear out his heart by making it do the extra work of thousands of utterly unnecessary beats every day. The span of life appears to be inversely proportional to the pulse rate.

Vulgar haste and noise are not civilization.

Fortune sells many things to the hasty, which she gives to the slow-Bacon.

Medical News

DR. D. N. CHATTERJEE

THE death took place, after a brief illness, of Dr. D. N. Chatterjee, Blood Transfusion Officer, Government of West Bengal, on Wednesday, the 4th February, at his Calcutta residence, 16, Bhabananda Road. He was the only son of Dr. Nandalal Chatterjee, formerly Personal Physician to the Maharajadhiraj of Burdwan. He was only 49 and leaves behind his old father, widow, four children, three sisters, a large number of other relatives

and friends to mourn his loss.

After getting his M.B. degree Dr. Chatterjee went to England in 1929. During his stay there for nearly 2 years he got his L.R.C.P. and M.R.C.S. and was the first doctor from Bengal to obtain the Diploma in Bacteriology from London University. He was attached for some time to the School of Tropical Medicine in connection with Cholera Research. In 1941 he commenced work in the Blood Bank then run by the Imperial Sorologist in the promises of the School of Imperial Serologist in the premises of the School of Tropical Medicine and the adjoining Carmichael Hospital for Tropical Diseases. Later, when the bank was transferred to the All-India Institute of Hygiene mostly as a serum bank for the needs of the Astropy. Or. Chatterjee, together with colleagues trained previously in the original blood bank made it a successively in the original blood bank made it a successively in the original blood bank made it a successive trained previously in the original blood bank made it a successive trained previously in the original blood bank made it a successive trained previously in the original blood bank made it a successive trained previously in the original blood bank made it a successive trained previously in the original blood bank made it a successive trained to the collection of the coll ously in the original blood bank, made it a success under the Director of the aforesaid institute. Later still on the termination of the war and the closing down of the serum bank Dr. Chatterjee took charge of the new Blood Bank under the Government of Bengal.

The medical profession in Bengal has lost a keen worker in Dr. Chatterjee.

INDIAN MEDICAL ASSOCIATION

RESEARCH FELLOWSHIP

DR. P. K. Guha, M.B., M.R.C.S., D.O.M.S., Honorary General Secretary, Indian Medical Association, invites applications for four Research Fellowship under the Medical Association Research Fund of the value of Rs. 250 each per month. The fellowship is open to men and women and will be tenable for a period of not more than two years. The applicants must be medical practitioners whose names occur on the Provincial Medical Registers.

The applicants must furnish the following informations in their applications along with certificates of physical fitness and characters:—

(a) Full name.

(b) Age and sex.

(c) Permanent address.

- (d) Details of academic career, including particulars of previous research work done by the candidate.
- (e) Particulars of the proposed research scheme.
- (f) Details of financial supports from other sources which the applicant will be in receipt of during the period of fellowship.

The note on the proposed research under item (e) should give (I) a résumé of research work done on the subject, indicating the present state of the knowledge on the subject (II) details of the proposed research, indicating (i) the methods to be employed, (ii) previous experience in the use of these methods and (iii) the experiments to be carried out.

Five typed copies of the note on the proposed research should be sent.

Applications must be forwarded through the Principal or Dean of a Medical College or the Director or the Officer-in-Charge of a Laboratory or Institute where the applicant proposes to work and must be accompanied by a letter from the forwarding authority that he has critically examined the details of the proposed research and that he is willing to guide and direct as far as possible the investigation and provide laboratory facilities and the contingent expenses for the particular line of work will be provided by the College or the Institute concerned.

The progress of the work must be communicated every six months to the Honorary General Secretary of the Indian Medical Association, 23, Samavaya Mansion, Corporation Place, Calcutta 13.

Typed applications should be addressed to the Honorary General Secretary, Indian Medical Association, 23, Samavaya Mansion, Corporation Place, Calcutta 13, so as to reach the Association Office before the 30th April 1948. the 30th April, 1948.

ROYAL SOCIETY HONOURS AUSTRALIAN SCIENTIST

RESEARCH DIRECTOR OF NOTED INSTITUTE

(Reproduced from Release No. P/767, issued by the Public Relations Officer, Australian High Commissioner's Office, New Delhi)

PROFESSOR FRANK McFarlane Burnet, Director of the Walter and Eliza Hall Institute, Melbourne, has been awarded the Royal Gold Medal of the Royal Society

in London for notable biological research.

The medal is one of the two that are awarded by the Royal Society annually for highly meritorious work in the fields of biological and physical research. Professor Burnet's award was for 'distinguished work on bacteriophages, viruses, and immunity'.

Professor Burnet has been associated since 1923 with the Walter and Eliza Hall Institute which is inter-

the Walter and Eliza Hall Institute, which is internationally known in medical circles for its advanced research work. He became director in 1943.

He has carried out important work in the virus field, particularly in relation to immunization against influenza. A notable contribution he has made is the development of the technique of growing viruses in hen's eggs.

He has made important contributions in the field of virus immunology and also of the natural history of

disease.

Among medical men he has been described as 'one of the greatest authorities in the world on viruses which cause infantile paralysis, influenza, mumps and

other diseases

Walter and Eliza Hall Institute was founded in 1916, and is attached to the Royal Melbourne Hospital. Prominent in its development was Professor Burnet's predecessor, Dr. C. H. Kellaway, who was appointed to the post of scientific director of the Wellcome Foundation.

The production of influenza virus vaccine was only one of an extensive range of research activities that have made the name of the Institute widely known. Under Professor Burnet's direction, methods were evolved for inoculating eggs half-way through incubation with influenza virus and harvesting the vaccine.

evolved for inoculating eggs nair-way through incuba-tion, with influenza virus and harvesting the vaccine after a further incubation period of two days. Investigation of snake-bite clarified information on the action of the venoms and led to the production of antivenene for treatment of bites. Research has also been made into the venoms of spiders, the bee, and

the Australian platypus.

The Institute isolated the organism responsible for an infectious disease known as 'A' fever (it originated in the Australian State of Queensland), though much credit goes to other workers in Queensland for the investigation of the disease.

Studies of immunity covered the manner in which the body achieves protection against injury, and the cause of injury, whether by bacteria, by viruses, by bacterial poisons such as those produced in gas gangrene

or in carbuncles, or by animal poisons.

Important researches have been made into virus diseases of man and animal such as infantile paralysis, herpes and roup with bacterial diseases, dysentery, tuberculosis, into staphylococcal toxin, blood pigments, and shorical detection of poisons such as lead and and chemical detection of poisons such as lead and arsenic.

In common with overseas countries which are devoting much attention to possible methods of killing germs like the influenza virus, the Institute has also been experimenting with antiseptic mists and vaporisers. A method developed by the Institute is in standard use in Australia for estimation of carbon monoxide in air

in Australia for estimation of carbon monoxide in air or in the blood of persons exposed to the gas.

One unexpected discovery made by the Institute in the course of research was that an unimportant virus disease in mice was closely related to smallpox and vaccinia (cow-pox). The vaccine lymph, used to protect human beings against smallpox, was just as effective in protecting mice against this highly fatal mouse-pox. This was of interest because of its relationship to the first piece of virus investigation—Jenner's discovery of vaccination with cow-pox. discovery of vaccination with cow-pox.

LIST OF JOURNALS AND PERIODICALS RECEIVED IN THE LIBRARY, DIRECTORATE-GENERAL OF HEALTH SERVICES (COR-RECTED UP TO 1ST JANUARY, 1948)

 Abstracts of World Medicine.
 Abstracts of World Surgery, Obstetrics and Gynæcology.

American Journal of Clinical Pathology. American Journal of Digestive Diseases. American Journal of Diseases of Children. 3.

American Journal of Hygiene.
American Journal of the Medical Sciences.
American Journal of Nursing.

American Journal of Obstetrics and Gynæcology. American Journal of Ophthalmology. American Journal of Medicine.

10.

11. 12.

American Journal of Pathology. American Journal of Physical Anthropology.

13. American Journal of Pharmacy. American Journal of Psychiatry 14. 15.

American Journal of Public Health and Nation's 16.

American Journal of Roentgenology and Radium Therapy.

18. American Journal of Sociology.19. American Journal of Surgery.

- American Journal of Syphilis, Gonorrhœa and Venereal Diseases.
- American Journal of Tropical Medicine.
- American Library Association Bulletin (A. L. A. Bulletin).
- American Review of Soviet Medicine. 24. American Review of Tuberculosis.

American Sociological Review.

Ancient India. Anglo-Indian Review. 27. 28.

29.

30.

Annals of Allergy.
Annals of Eugenics.
Annals of Internal Medicine.
Annals of Mathematical Statistics.
Annals of Otology, Rhinology and Laryngology.
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33.

34. Analyst.

35.

Archives of Biochemistry.
Archives of Dermatology and Syphilology.
Archives of Disease in Childhood. 36.

37.

Archives of Internal Medicine.
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ARTIFICIAL PLASMA FOR TRANSFUSIONS

(Reprinted from Release No. F/207, issued by British Information Services, Eastern House, Mansingh Road, New Delhi)

British scientists are making artificial blood plasma from fungus which sugar refiners have been throwing away for years. Tests at the world-famous Lister Institute in London have proved that this artificial plasma can be used in a wide range of blood transfusions.

A full series of medical tests is now being undertaken and final results will be known in six to nine months. The first steps towards the discovery of this new lifesaver were taken by a group of young scientists before the war. When they joined the Forces, Professor Sir Norman Howarth and Professor Stacey of Birmingham University carried on the work.

Sir Norman, talking about the success of the Lister Institute tests, told a press reporter recently: 'I am no medical man, but I gather that our solution can be used to maintain heart action until the patient's body can produce new blood. The solution is cheap and easy to make. It can be stored in powder form and mixed and heated for use quickly'.

PURCHASE TAX ON DRUGS

THE Chancellor of the Exchequer in his Budget Speech on 12th November proposed certain increases in the present rates of purchase tax. The tax on the doctor's traditional black bag will increase from the present 33s per cent to 50 per cent. Most instruments will continue to be free from purchase tax, but the tax on the lamp in cystoscopes and ophthalmoscopes and similar instruments will be increased. More important, however, is the fact that a large number of drugs are likely to become subject to tax at 333 per cent of the wholesale price instead of 162 1000 red

This increase will affect many of the alkaloids and barbiturates; thiouracil and digitoxin; quinine, mepacrine, and pamaquin; aspirin, phenacetin, and the bromides; cascara, liquid paraffin, and castor oil; and most of the extracts, liniments, tinctures, syrups, elixirs, and the like the tracts of the extracts, liniments, tinctures, syrups, elixirs, and the like the tracts of the extracts. and the like. Under the purchase tax (exemptions) (no. 2) Order of 1945 penicillin and the sulphonamides, vaccines and sera, cocaine and morphine, and vitamins vaccines and sera, cocaine and morphine, and vitamins A, B, C and D, except in ampoules for injection, are exempt from purchase tax, as are pethidine, procaine, and certain other preparations. The British Medical Association has already protested to the Ministry of Health against this increase in the cost to the patient of a wide range of prescriptions. Many of the drugs affected by the proposed increase in purchase tax are in constant use by the dispensing practitioner. A substantial rise in the cost of these medicines is bound to fall most heavily on the chronic sick. The Association has urged that the whole question should be reconsidered.

The Treasury is clearly interested in the revenue from the taxation of nationally advertised proprietary medicines. Penicillin and the sulphonamides, among other things, have been treated differently. They have other things, have been treated differently. They have not been subject to purchase tax and it has not been thought necessary to alter this exemption. Surely there is a case for widening what Mr. Dalton called the 'free list' to include drugs which are just as essential to the treatment of the individual patient. It is illogical to apply a purchase tax to the treatment of toxic goitre or malaria while exempting from tax the treatment of pneumonia or gonorrhusa.

treatment of pneumonia or gonorrhæa.

DENTISTS' ACT. 1948

(Abstracted from a note supplied by the Honorary General Secretary, All-India Dental Association, General Secretary, Association. New Delhi)

THE Dentists' Act, 1948, was passed by the Parliament of the Union of India on the 26th February, 1948. This Act will have jurisdiction over all the Provinces and States of India. The Act provides for the immediate establishment of registers:

(1) for Dentists,

(2) for Dental Hygienists, and (3) for Dental Mechanics.

The Dentists' Register is divided into two parts, i.c. 'A' and 'B'. Part 'A' consists of those persons who are qualified from recognized dental schools in India and abroad according to the Schedule attached to the Act and 'B' for those who are not qualified but can prove that they have been in practice in dentistry for the last five years. These persons will be entitled to sit for an examination within a period of five years to qualify to come on part 'A' of the register. After the first registration, register 'B' will cease to exist and no person other than qualified dental surgeons will thereafter be entitled to register or practise in the Union.

(2) Only Indian citizens can register for practise in the Union until and unless a scheme of reciprocity has been established between foreign countries and the Dental Council of India. The scheme of reciprocity insists that qualified Indian dental surgeons shall be allowed to register and practise in that foreign country before nationals of the same country are allowed to

register and practise in India,

under conditions not more onerous than those imposed on the nationals of that State or country to enter and practise the profession of dentistry in

(3) Henceforth, no unregistered person shall be allowed to use the titles of Dental Surgeon, Dental Practitioner, Surgeon Dentist, etc., nor will be admitted to practise in the Union. The penalty for the same is a fine and imprisonment. Companies will not be allowed to appear in the practice of dentisting in the allowed to engage in the practice of dentistry in India unless the majority of the Directors are Dental Surgeons.

Public Health Section

INDUSTRY AND MEDICINE*

By S. CHAKRAVORTI, L.R.C.P. (Lond.), M.R.C.S. (Eng.) Staff Medical Officer, Imperial Chemical Industries (India) Limited, Calcutta

THE essence of the term 'industrialization' implies that production has passed from the control of individual handicraftsmen into the hands of those who can afford to buy the These industrialists (or capitalists, machines. as they are sometimes called) employ other men to work the machines and claim possession of the goods so produced in return for wages.

There are two aspects of this industrial fabric which concern health problems and come within the realm of industrial medicine. Firstly, that men, women and children, in order to earn a living, have to go to work in factories under conditions over which they have no control at all, and secondly, that these workers are, or should be, in good health at the time of their

entry into employment.

Industrial medicine aims at maintaining the health of this industrial population. Here the physician is working with a group of people, mostly adults, who are or should be in good health, trying to keep them well and efficient at work. Industrial medicine thus becomes the practice of adult health under working conditions (Wampler, 1943). In this respect it differs from the principles of general medicine where the physician's healing hand is usually offered to the sick and ailing.

Some measure of control of work conditions and environment is attempted by the various Factories Acts, but the actual medical guidance, at present, sought for detection of toxic hazards and investigation of health problems in industry is pathetically small. Indian Factories Acts also provide compensation when gross and irreparable damage has been done to health either from injury received whilst at work or from such specific occupational diseases as anthrax, lead and phosphorus poisoning, chrome ulceration, arsenic and benzene poisoning, caisson disease, mercurial poisoning, pathological manifestations due to radium and x-rays, and primary epitheliomata of the skin, but so far little or no provision has been made to enforce the employer of labour to try and prevent occurrences of these, and many other, grave disabling diseases In this respect the English of industry. Factories Acts and those of other European countries are more advanced and aim at preventing accidents and illnesses occuring in the factory in preference to paying out monetary compensation when the goose that laid the golden egg was dead or dying.

Industrial psychology

The doctor-patient relationship in industry is somewhat different. A healthy person normally resents the intrusion of a doctor into the questions of his personal and environmental hygiene. He is healthy, at least so he thinks, and as

such he has no use for the doctor.

An average worker, on the other hand, feels so much better from the presence of a doctor in the factory that he performs his duties with zest and with a sense of security that he would be looked after in case anything should go wrong. This is particularly true, the more hazardous the industry. The employer profits in turn, and also stands on solid ground so far as public opinion is concerned, for it reflects his attitude and human interest in the welfare of his employees. To-day incidences of lead poisoning, silicosis, nitrous fume poisoning and the like would be regarded as evidence of neglect on the part of factory management, just as an epidemic of milk-borne typhoid would indicate negligence on the part of the public health officials (Page, 1946).

A sound knowledge of modern psychology and its application to industrial problems is essential for the factory doctor. His assignment in industry is not merely to ensure a high standard of hygiene in the factory, but it is expected that he should take an active part in such matters as vocational guidance, occupation selection, investigation of the causes of industrial fatigue, accidents, and labour unrest. It is necessary also that he should know the 'mental hygiene' of the workers and pay close attention to emotional as distinct from purely physical factors which determine success or failure in an occupation.

Industrial environment and hygiene

Under this heading we are concerned with the physical conditions of work in the factory, namely ventilation, heating, lighting, over-crowding, humidity, comfort, noise, hours of work, speed of work, rest periods, washing facilities, drinking water, canteen and mess-room facilities, etc., and, this is most important, a sympathetic insight into the physical and mental effort demanded of the workers in any particular process or industry.

Rate of air-flow, optimum temperature, humidity, and number of air-changes per hour are necessary knowledge for the factory doctor so that he is in a position to advise the management of any irregularity and also work in conjunction with the chemist and the architect to ensure comfortable and safe working conditions.

Available working space is a very important factor in connection with the speed and efficiency of work and also in the control of droplet infection. The prevalence of infectious illness in any

^{*} Read at a Medical Society Meeting of the Topiwala National Medical College, Bombay, on 15th July, 1947.

part of a factory may be an indication of defective ventilation. A factory should not be so overcrowded as to cause any risk to health and it is generally agreed that some 400 cubic feet per person is a reasonable minimum to ensure personal comfort and good ventilation. To have to work under cramped conditions gives rise to irritation and annoyance and eventually leads to fatigue. Good lighting, hygienic amenities and modern ventilating devices are all necessary adjuncts to help make the inside of a factory pleasant and congenial and thereby prevent setbacks, especially group-fatigue, possible impaired efficiency of production and absenteeism.

Industrially produced toxic substances usually take the form of dusts, fumes, gases, vapour, mists or liquids. As a rule the industrial chemist is fully alive to the hazards involved in the processes which he supervises; in fact the same cannot always be said for the management. All industrially produced dusts and fumes are potentially injurious to health in high enough concentration; some are actively dangerous by reason of their chemical or physical properties. To wit: carbon monoxide has no smell and is slightly heavier than air; other poisons like lead or mercury vapour possess no odour and are invisible. The vapour of some of the volatile solvents such as ether, carbon bisulphide or tetrachloride may accumulate in dangerous proportions in enclosed spaces. The industrial medical officer must possess a thorough knowledge of the physiological reactions of all toxic substances which are handled in the factory in order to be able, in the first instance, to treat any case of poisoning, and secondly, to co-operate with the management, the chemist, and the engineer with a view to minimize the risks and prevent recurrence of any mishap.

There are various means by which to remove or render harmless these toxic fumes and gases which may escape in the air in the immediate environment of a worker. Complete enclosure of a dangerous process in which toxic substances are produced is the safest method; a laboratory fume-cupboard is a simple illustration of this principle. When complete enclosure of the operation is not practicable one or other modern devices of exhaust system or dust extractors can be instituted. The doctor in conjunction with the engineer should know the speed and direction of air-flow required to extract or exhaust the toxic fumes. Various masks and preventive clothing are also worn by the operatives in certain hazardous processes, but on the whole it is wiser to try and make the operation safe rather than depend on the men to wear safety apparel.

Industrial accidents and diseases

By far the greatest loss to industry, both in men and material, is incurred through accidents. According to one American Insurance Company the direct and indirect costs of an average accident, causing disablement for 3 days or more, amount to some £200 (about Rs. 2,700) which serve to emphasize the economic burden of accidents quite apart from their social and 1942 more medical importance. In Rs. 18,69,359 was paid out in India as Workmen's Compensation for some 44,443 cases of accidents and occupational diseases, averaging Rs. 42 per case; a very small amount, but nevertheless when it is considered that this does not take into account such items as cost hospitals, loss of wages and expenses incurred by the workman, cost of spoilt material and tools, interruption in production, and time lost by other employees through interference of an accident in the factory, the net loss to the industry, and the society in general, would

assume very uneconomic proportions.

The frequency of accidents in the Indian factories is high; about 1 in 40.6 workers sustain physical injury in course of his work, and 1 in 6,818 meets with his death (Chakravorti, 1946), that is to say that the annual accident rate is about 2,463 per 100,000 employees, and the accident mortality or fatality rate is 6 per 1,000 reported case of accidents. The factory medical officer, apart from organizing an efficient firstaid and accident treatment centre, must also look deeper into the character and causes of accidents, the environmental factors such as improper guarding of machinery, defective equipment and work conditions, as opposed to such personal factors as age and experience, general health, accident proneness and fatigue. Further, the medical officer must also possess a good grasp of the law about accidents. The Workmen's Compensation and Industrial Injuries Acts are complicated legal issues, and their application can produce most puzzling results unless those concerned understand these procedures fully. Both the employer and employee can quite innocently be guilty of what the law would regard as gross and culpable negligence, and the duty of the works medical officer is to try and safeguard the interest of both parties when he can, and this is often necessary (Kefalas, 1942).

Apart from accidents there are a number of clinical conditions already recognized, and many more yet undetected, which are caused or aggravated by industrial conditions and environment. Silicosis, furnace cataract, beat joints, cancers, anæmias, tar and miner's nystagmus are widely different examples chosen at random, to name only a few from a formidable list of industrial diseases. Each industry has its own particular hazard and every worker bears his own individual risk; some will work for many years at a really risky job and never have a mishap whereas another will be incapacitated by an apparently harmless occupation in a

matter of months.

It is not enough for the works doctor to be able to diagnose and treat a case of industrial poisoning but he must also be thoroughly

acquainted with the methods of testing for these substances in the atmosphere, sweepings and clothing. He must keep constant vigilance to recognize the earliest symptoms of poisoning, and if necessary, to remove the worker from a toxic to an innocuous job, for the time being, to enable him to recover before permanent damage is done to his health. It is essential also that the medical officer in industry should endeavour to know by what route-respiratory, alimentary or cutaneous—a poisonous substance is being absorbed. In the majority of industries absorption through the respiratory tract is of overwhelming importance. Contrary to popular belief lead poisoning is not so much due to eating with unwashed hands but due to inhalation of the lead dusts and fumes. It has been shown by experimental work that more lead particles may be absorbed in one day from a single injection into the respiratory tract than from gastrointestinal exposure lasting for months. In other industries absorption through the skin is of importance second only to the lungs, for example, in the handling of aniline, T.N.T., nitrobenzene, and liquids in general which are lipoid solvents. When the portal of entry of a toxic substance is known the physician, in consultation with the management, should be able to indicate the methods of protection which should be adopted.

No discussion on industrial diseases can overlook the important subject of occupational skin disorders. The incidence of industrial dermatitis is high and the occupations involved are varied; dyers and printers, French polishers and bakers, chemical workers and sugar refiners are all liable to suffer from this affliction. The condition of the skin itself-hot, greasy and perspiring, for example—and the physical properties of the substance handled, namely, low melting point, Ph value, lipoid miscibility, etc., are determining factors in the causation of occupational dermatitis. The diagnosis largely depends on the history of the patient and localization of the lesions. There is no essential clinical difference between a patch of dermatitis produced as the result of an occupational irritant and the patches which arise de novo, widely and diffusely, from known or obscure endogenous cause.

Occupational dermatitis usually begins on the exposed parts, the hands, the fingers and the forearms, if the offending material is a solid or liquid, and also on the face and neck if it is a vapour. The covered parts of the body are affected if the vapour or dusts are able to penetrate the clothing such as petroleum oils and waxes or finely powdered rubber chemicals. Sometimes an occupational dermatitis may become generalized. This occurs especially when the worker has developed a high degree of sensitivity towards an irritant. Some of the intermediate organic chemicals used in the manufacture of dyestuffs and explosives are notorious sensitizers. Industrial dermatitis is largely preventable, and if proper attention is given to personal cleanliness, use of protective clothing

and barrier creams, much unnecessary waste of health and money will be stopped.

Conclusion

Modern emphasis is on prevention, and indeed industrial medicine is a practice of 'group medicine' whose principal aim is prevention of sickness and accidents in the factory and to maintain health and efficiency of the men who work. We recognize that it is the weakest who first goes to the wall, and one or two cases of fatigue, occupational poisoning, or accident should immediately arouse suspicion that a whole group of people are possibly exposed to a particular hazard, and it is up to the physician engaged in industrial practice to investigate the cause and bring it to the notice of the management for prompt remedy. The workers must also realize the character of hazards as well as managers and doctors and the factory physician should insist on the necessity of educating them to take an interest in their personal safety and in the methods of protection which are applicable for their particular jobs.

The benefits derived from hygienic conditions of work, adequate ventilation and lighting, facilities for obtaining wholesome food at a reasonable cost, and opportunities for rest and recreation when off-duty are not only a necessity for the worker, but of ultimate advantage to the industry. The factory may well from the pivot of learning simple rules of hygiene and healthy habits to be translated into the home for the enjoyment of a healthy and useful life; this then is the mission of industrial medicine, to guide industry along a healthy path to progress and prosperity.

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NUTRITION OF T. N. MEDICAL COLLEGE HOSTEL STUDENTS

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A DIET survey of the hostel mess of the T. N. Medical College, Bombay, was undertaken for a period of 10 days in September 1947. The mess provides vegetarian food only. The club has on its register 112 members, 46 of whom staying in the college hostel took their meals regularly twice a day from the mess during the period of the survey. The remaining students staying in the city were only one-meal members of the mess. A detailed analysis of these 46 is put forth in this paper as it was difficult to

estimate the food taken by the one-meal members outside. Of these 46, 41 were Hindus, 4 Muslims, and 1 Parsee; 25 came from Gujrat, 15 from Maharastra, 2 from Bombay and 4 from upcountry; 30 professed to be vegetarians and 16 mixed dieters but actually on the days of survey 38 took eggs and 5 persons meat. The mess bill comes to about Rs. 45 to 50 p.m.

They keep fairly good health but complain of getting easily tired. Sore throat, stomatitis and constipation are their most common complaints. Eight complained that they had lost their weight during the term. None of the students examined showed signs of any manifest deficiency disease but their past histories revealed that seven had suffered from typhoid, two from sprue, one from dysentery, two from hypertension and one man's kidney had been removed.

The food served in the mess is typical Gujrati vegetable and middle-class diet. Rice, chapati, dal, one pulse and vegetable and curds are served at noon and puri or chapati, rice dal or kichri, vegetable, papad and milk in the evening. More than twice in a week they take 'farsan', i.e. fried dishes. No non-vegetarian food is served in the club.

The students supplement this diet by taking a small breakfast of tea or milk and bread or puri or plantain in the morning and an afternoon tea. This they mostly prepare in their own rooms.

Method of survey.—(Food grains, oil, ghee,

Items required for cooking were locked up and weighed every day during the 10 days of the survey. The cooked food left in the mess after the persons had taken their meals was accounted for but the items left in the dishes could not be estimated.

The results of the survey are shown in the accompanying tables and are compared with those of similar surveys. These are gross food values, for 'net' figures about 10 per cent has to be deducted. The food values have been taken from tables given in Health Bulletin 23, prepared by Aykroyd (1941). Methods of cooking adopted here are likely to alter the values, especially of vitamins, considerably.

Methods of cooking.—Mostly polished rice was available and the water in which it was boiled was thrown away. This may remove the little vitamin B, left. Water in which vegetables were cooked was also removed. Most of the vegetables were cooked, sometimes for long time, and soda was used in cooking dal, pulses and sometimes vegetables. Considerable loss of vitamins was thus likely to have occurred. Fried articles were consumed often. Puri was taken almost every evening. Ghee used was half vegetable and half so-called pure. The vitamin A content of ghee though estimated at 1,000 units per 100 gm. in the calculations may not be correct. One may similarly doubt the composition of the milk served here. Again, how many calories and how much of vitamins B and C were lost in the process of cooking is difficult to say. Perhaps most of the vitamin C content was rendered unavailable.

Calories.—The diet is adequate in calories for sedentary persons, viz, 2,900 calories per day. For boys of similar age the Nutrition Research Council, Washington (1945), recommends 3,800 calories.

Proteins.—The club gives 57.14 gm. proteins per day, out of which 5.4 gm. are from animal source. Many students take eggs and milk outside and thus the vegetarians make up 66.74 gm. (10.74 animal) and non-vegetarians 71.42 gm. (14.74 animal) proteins per day. As regards the total protein intake opinions have varied from time to time, but 71.42 gm. per day are not far below the amount recommended by various authorities.

Table I
Chief items consumed per head per day in gm.

	Vegetarian, gm.	Mixed diet, gm.
Rice Wheat, jovar or atta Pulses Vegetables Butter, ghee or oil Sugar or gur Milk and curds Mava Egg Meat Salt	 79.6 131 6 145.4 700.0 92.8 51.2 174.4 11.32 3/5 eggs	81.6 144.6 155.4 700.0 92.8 51.2 189.4 11.32 3/4 eggs 13.6 13.0

The proportion of animal proteins consumed is unsatisfactory. The British Medical Association Nutrition Committee had recommended that even unemployed men should have 50 gm. of animal proteins per day. The army gives much more to soldiers and the War Office had granted 62 per cent of total proteins from animal source. Survey of middle-class English diets by Hutchison, Mottram and Graham (1940) shows that 67 gm. of animal proteins are consumed per day by an adult in England. The Ministry of Health therefore put the figure for first-class proteins to 37 per cent minimum, i.e. about 25 gm. per day. Here the vegetarian students take only 10.74 gm. and the non-vegetarians 14.74 gm. of animal proteins per day. Whether the proteins of some foodstuffs of vegetable origin taken here are first class or not has still to be investigated. But from the light of researches made so far vegetable proteins are classed as incomplete.

Fats.—Sufficient amount of fat is taken; 54 gm. of oil, about 18 gm. of pure ghee and 18 gm. of vegetable ghee are consumed per day. The vitamin A value of ghee is taken at 1,000 I.U. per 100 gm., but as Aykroyd remarks, this is doubtful. Again how much fat is lost in cooking has to be ascertained as fried things are

consumed often,

TABLE II

				O-1	Dham		v	itamins		-	
	Proteins, gm.	Fats, gm.	Carbo- hydrates, gm.	Cal- eium, gm.	Phosphates, gm.	Iron, mg.	A, I.Ü.	B _i , 1.U.	C, mg.	Total calories	REMARKS
Food served in the mess per dish.	28.57 2.62 (a)	52.57	166.47	0.293	0.424	15.06	730	136.0	32.7	1,288.3	If multiplied by two gives the diet given per head per
Food supplemented per head per day by vegetarian (41) students.	9.7 5.5 (a)	7.92	53.06	0.310	0.23	3.52	568	12.25	11.5	329.8	day. Those taking eggs are also included in the vege- tarians.
Food supplemented per head per day by non-vegetarian	9.5 (a)	9.12	52.4	0.144	0.24	4.47	707	54.0	14.0	353.8	egiidus.
students (5). Total nutrition of vegetarian students		113.06	386.0	0.896	1.079	33.64	2,028	284.25	76.9	2,906.4	
per day. Total nutrition of non-vegetarian	71.42 14.74 (a)	114.26	395.34	0.730	1.089	34.59	2.167	326.0	79.4	•	
students per day. Ahmedabad Medica College Students Diet Survey, 1946 (Pathak, 1947).	' 6.6 (a)	95.66	394.6	0.72		31.1	1,028	662.0	30.0	2,752.0	Fresh vegetables were not available in last days of the survey.
Guirat Research Society Consumption in Guirati Families (Guirat Research Society, 1941). Diet recommended by Nutrition Research Council	6.96 (a)	82.63	385 6	0.741	1.0	34.8	1,508	555.0	49.5	2,550.7	
Washington (1945) For adult mer For boys 16-26	a 70.0			0.8	**	12.0 15.0	5,000 6,000	400.0 600.0	70.0 100.0	3,000.0 3,800.0	

(a) = Animal protein.

Carbohydrates.—About 400 gm. are taken per

day.

Calcium.—Calcium consumed is 1.72 gm. This is just short of the minimum recommended. Again the large part of the calcium is of vegetable origin and therefore less easily absorbed.

Phosphorus.—Phosphorus consumed is 1 gm. per day. Iron is taken adequately, 34 mg. But most of this is of vegetable origin hence less available to the body than that from animal

Vitamin A.—There is a definite deficiency. Almost every medical student here wears glasses in his college years. Again the too frequent occurrence of colds in the students may have some relationship with this deficiency. The diet hardly gives three hundred units of vitamin B1. 400 to 600 units are recommended by Nutrition Research Council, Washington (1945). pared to the Ahmedabad students or Gujrati families figures the diet here shows gross deficiency. Frequent sore throats and ulcers in the mouth have been reported. 75 to 80 mg. of vitamin C is taken per day. The Ahmedabad and Guirati families take only half of this. But one may strongly suspect that most of the vitamin C is rendered unavailable in the process of cooking and, therefore, the actual intake must be far below the normal level.

I thank Dr. D. D. Variava, O.B.E., F.R.C.S., Dean, Topiwala National Medical College, Bombay, for per-mission to publish this article and Messrs. Patel and Joshi, Secretaries of the Club, for their help in collecting the data.

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THE AIM OF MEDICAL INSPECTION OF SCHOLARS

By N. N. GUPTA

School Medical Officer, Bhagalpur Division, Bhagalpur

THE need for medical inspection grew out of desire to have children physically fit to

shoulder the responsibilities of the nation and also to have a statistics of healthy children.

The poor state of health of the school children had always been a concern of the leaders of different nations at different times who felt the necessity of going into the causes of certain defective physique of school children so that these might be successfully combated and eradicated before it was too late.

Nobody had given the matter serious attention until the year 1842 when France started medical inspection of schools by competent medical authorities maintained by the state. But their first attempt took some time to assume any definite shape and a definite system of school inspection was organized in Paris in 1879.

Sweden however claims to be the pioneer in this direction for there appears to have been medical officers engaged in some schools as early as 1830, and by 1869 there was not a public school in Sweden that had not a medical officer.

Belgium was not slow in taking the cue and Brussels had medical officers appointed in 1874.

Germany did not lag behind and the first school doctor was appointed in Germany in 1883. Though she had been forestalled by other countries she may claim the credit of having first a system of medical inspection of a comparatively modern type in full working order and between 1890 and 1900 the movement spread widely throughout Germany.

Cairo (1882), Hungary (1887), Moscow (1888), Norway (1891), Rumania (1899) and Switzerland (1894) soon followed suit in quick succession and by the first decade of the twentieth century there was not a country in Europe that did not evolve some system or other of medical inspection of the school-going boys.

In England the year 1903 will always remain a memorable one in the annals of medical inspection of school children, the year that saw the publication of the report of the Royal Commission on physical training. The statistics published in that report show a deplorable condition of affairs in regard to the physique of a large number of school children. The year following did not show any improvement and the report of the Inter-Departmental Committee on physical deterioration greatly stirred the public mind. Prior to this the London School Board had appointed a medical officer in 1891 though it was not before the passing of the Education Administrative Provision Act in August 1907 that medical inspection of children in public elementary schools was made compulsory.

In U.S.A. Boston gave the lead in 1894 and was followed by Chicago in 1895 and New York in 1897.

In our continent Japan quickly saw the advantage of this system and the following extract from an account of the system by F. J. Haskin is worth reproducing: 'The Japanese system of medical inspection extends all over the

empire and reaches the most remote rural community. The Japanese Department of Education is able to tell how many children are in school in the empire, how many are robust, medium or weak and how many have defective eyesight and what diseases are most frequent at different ages of school life'. In England as previously stated the attention

of the general public was drawn in this direction by the Royal Commission of 1903 which was appointed as a sequel to the rejection of a number of recruits during the South African War. The findings of the Commission were:

(i) That many of the defects found in the recruiting stations had their origin in early life.

(ii) That physical training in schools could not be efficiently developed except under medical supervision. (iii) That even for the purpose of general education medical inspection of the school children had become necessary.

These findings formulated the objects of medical inspection which may be tabulated thus:—

- (i) To ascertain the actual health condition of the whole school-going population, i.e., to record their height, weight, nutrition, mental condition, etc.
- (ii) To detect the presence of contagious diseases and thereby to protect the child and the community.
- (iii) To detect physical defects that prevent the child from taking full advantage of education.
- (iv) To find the capacity of the individual pupil to acquire knowledge in accordance with his mental and physical aptitudes.
- (v) To ensure the best possible hygienic surroundings for the child while he is at school with special reference to lighting, ventilation, water supply, conservancy, etc., in order that the health of the child may not suffer.

(vi) To bring about a close relationship between school and home and to ensure treatment of discovered defects.

(vii) To teach practice of hygiene and healthful living both in school and at home.

Actuated by these objects the Government of Behar and Orissa inaugurated this system in schools under it in the year 1920 and since then it is working. The Government has tried to bring a qualified medical man to the door of every school child without any charge on the part of its guardian and expects that the guardian would respond and help in building up a healthy nation. Unfortunately our people are so apathetic that, for fear of additional work, they discountenance even laudable efforts towards effecting improvements in existing institutions.

The organization nevertheless has not given up its attempts and its utility is being admitted however slow may be its progress.

Willing co-operation is first sought and it is hoped that gradually all will equally realize its

importance if they carefully go through its findings as a result of medical inspection of some important institutions.

Findings for the year 1939 in Bhagalpur Division. Cases examined 3.332

Number and percentage of defective vision 536, i.e. 18%

" " " poor nutrition 635, i.e. 22%

" nenlarged tonsils 705, i.e. 24%

" neck glands

palpable .. 271, i.e. 9%

neck glands

palpable .. 271, i.e. 9%

neck glands

palpable .. 271, i.e. 9%

neck glands

palpable .. 271, i.e. 9%

neck glands

Remedies.—To counteract these evils active co-operation between the guardians, school authorities and public health department is very essential. Good and nutritious food, ample exercise and healthy surroundings must be provided for if these examinations or any attempts towards them need be successful.

Malnutrition, excessive mental strain, evils of bad company like satisfaction of sexual appetite, taking to intoxicants, etc., are primarily responsible for the defects foundthough a portion of it may be due to hereditary causes. Nutritious food specially milk should be given to the boys during school hours and necessary expenses should be borne by the state as the individual is after all a unit of the state, and as every healthy individual is an asset to it. Further as the school is regarded as the veritable source for the spread of infection amongst children specially measles, whooping cough, mumps, diphtheria, ophthalmia, chicken pox, scabies, T.B., and leprosy, etc., medical inspection and consequent segregation would be a measure of safety the importance of which cannot be overestimated. These infections when carried home spread the germs in the family and cause further mischief. Medical inspection proves a check to it and the insisting of personal cleanliness neglected in many instances saves the families from utter destruction.

The advantages of this system thus are too many to be enumerated and with the co-operation of the public and the authorities of the schools continuing it it may be hoped that in the near future provisions could be made for the healthy growth of the individual.

The Indian Medical Gazette fifty Years Ago

HOSPITAL ABUSE

(Reprinted from the *Indian Medical Gazette*, Vol. 33, February 1898, p. 62)

The question of hospital abuse has been largely discussed of late in the English medical journals, and this question is still before the various hospital boards. The dislike of the poor to attend hospitals has long been overcome in

London and the large provincial towns and the agricultural class seldom nowadays make any objection to seeking advice at the nearest institution. But the out-patient department and even the in-patient as well is now, no doubt, largely attended by persons who can perfectly well afford to pay for the services of a private practitioner, and the shame which in former days was felt by persons in fair circumstances at the very idea of going to a hospital, appears to have been replaced by a desire to avoid paying a medical man at all, thus depriving the local medical practitioners of their just dues. A cry has, therefore, been raised by the latter against the carelessness of the hospital officials, and a similar complaint is made in the presidency towns of India by private practitioners, especially as regards hospitals where Europeans are

Now, the position of hospitals in this country is very different, and as far as natives are concerned it does not seem that any great cause of complaint exists. A few well-to-do persons, who are actually attended in their own homes by their family doctor, no doubt, do, in cases requiring consultation, not infrequently resort to a hospital for a special opinion, sometimes with the full consent of their medical man, who for reasons best known to himself may even send them there himself and thus unfairly save them the expense of a consultation fee. This is especially likely to occur when there is a question of operation to which the patient will not submit without a further opinion, while the family doctor, from a feeling of false pride, is unwilling to call in a consultant. In the large presidency towns it is not always easy to determine, and impossible to positively ascertain, the circumstances of such persons, and a certain number do obtain under false pretences both as out and in-patients the advices of the medical officers for nothing.

Generally speaking, however, the rules of caste deter the better classes from entering the wards where they would necessarily mix with patients of the lowest caste, but they do endeavour occasionally to obtain separate accommodation and this leads usually into an inquiry into their circumstances.

On the other hand, the out-patient departments of some of the presidency European hospitals appear to be used to a very considerable extent by persons who cannot be considered either paupers or in poor circumstances. They would be disgusted if their social position was questioned when a function at government house was concerned, and yet they have no shame in obtaining medical advice, and even treatment at a charitable institution. In fact, the number of private carriages to be seen in front of such institutions is sufficient proof of the circumstances of their owners, who drive up in them apparently without any idea of the incongruous appearance they present. As regards the inpatients, however, the wards are divided into

free and paying wards, the latter arranged on different scales from one rupee upwards, the highest terms being extremely moderate and much or considerably less than the expenses likely to be incurred in providing nurses and medical attendance at the patient's own house. The hospital, therefore, largely enters into competition with private practitioners. There is much, no doubt, to be said as regards the advantages of hospital nursing, and the attendance to be obtained of a resident medical officer at a moment's notice in urgent cases, and it is right that government should afford military and other officers or employees the best accommodation and medical comforts available, particularly in the case of patients who have come from upcountry for a change and treatment or who may be taken ill when residing in presidency towns, and whose means would possibly be limited. But is it necessary that a larger staff of nurses and servants should be maintained for the convenience of residents suffering from minor complaints, such as sprains, simple fractures, ingrowing toe nails, etc., who would hardly be considered in England under any circumstances as cases for admission? cannot blame people for taking advantages of these privileges if they can be procured, but

many of these patients are assistants in banks, mercantile firms, etc., and are perfectly able to pay for the attendance of a medical man at their own houses for ailments such as these; yet it would be found on inquiry that the medical officers of these hospitals have to devote considerable time and attention to such patients, which might well be bestowed on the poorer class, in consequence of which an impression prevails that the latter are somewhat neglected for the sake of those who pay in the other wards. Medical officers should remember, in the case of out-patients at all events, that they are entitled and expected to use their discretion and to see that the hospital charity is not abused. No fear of unpopularity should prevent them from performing their duty in this respect and the complaints, which some of them have made, can be answered by the fact that the remedy lies in their own hands. Under existing rules, it is impossible for them to refuse admission to paying patients, and it seems, therefore, that some inquiry should be made into this department by the authorities, for, as we contend, hospitals—even when a small daily payment is made-were never intended for the convenience of the class of patients to whom we have already referred.

Current Topics, Etc.

The Clinical Analysis of 550 Cases of Bacterial Meningitis: Diagnostic Features and Various Methods of Treatment

By P. S. RHOADS

(Abstracted from the American Practitioner, Vol. 1, February 1947, p. 305)

In a series of 550 consecutive cases of bacterial meningitis studied at Cook County Contagious Hospital from December 1943 to September 1946, all of the usual types were encountered, but meningococcic meningitis constituted 71.5 per cent of the cases.

The importance of making an ætiologic diagnosis and evaluating those factors which influence mortality

is emphasized.

Treatment of the various types of bacterial meningitis was more successful with sulphamerazine and sulpha-

diazine than with sulphathiazole.

Penicillin used alone appeared to cure seven of nine cases. It was used chiefly in conjunction with sulphonamides, both intrathecally and intramuscularly.

H. influenzee meningitis was treated with sulphonamides along the sulphonamides along the sulphonamides along the sulphonamides.

amides plus Alexander's rabbit serum with 50 per cent amides plus Alexanuer's raddit seruin with 50 per cent mortality. Since this report, three cures with strepto-mycin have been observed. Streptomycin appears to be the single most effective agent in this disease, but at present should be used in conjunction with sulphonamides and Alexander's rabbit serum.

PLAN FOR TREATMENT OF BACTERIAL MENINGITIS

1. Make an ætiologic diagnosis if possible.

(a) Spinal fluid smear, spinal fluid culture, blood culture.

(b) Complete blood count.

(c) Look for petechiæ-meningococcus meningitis. (Meningococci often found in smears from petechial hæmorrhages.)

(d) Look for otitis media.

Important atrium of infection in : streptococcus meningitis, pneumococcus meningitis, staphylococcus meningitis.

(e) Look for symptoms and signs of active endocarditis.

Important for diagnosis and prognosis in: streptococcus meningitis, pneumococcus meningitis.

(f) Examine lungs carefully.

Important in: pneumococcus meningitis, tuberculous meningitis.

2. For patients in shock:

(a) Plasma or whole blood intravenously.

(b) Adrenal cortical extract in full doses.

(c) Oxygen if cyanotic.

(d) Neosynephrin hypodermically.

3. General measures:

(a) Fluids to 3,000 c.c. daily by mouth or

intravenously (adult).
(b) Drainage of foci of infection, such as otitis media or acute sinusitis.

(c) Sedative for patients who are extremely

Paraldehyde; either in oil, per rectum; sodium phenobarbital or sodium amytal, subcutaneously.

4. Give penicillin in meningococcus, pneumococcus, streptococcus viridans, streptococcus hæmolyticus, staphylococcus meningitis.

20,000 units dissolved in 5 to 10 c.c. physiologic solution of sodium chloride intrathecally, after withdrawing 10 to 15 c.c. of spinal fluid. Repeat every 24 hours until spinal fluid remains sterile on culture.

25,000 to 40,000 units every three hours, by continuous intravenous drip, or intramuscularly until spinal fluid and blood remain sterile on culture. Doses up to 1,000,000 units daily if the patient has bacterial endocarditis.

5. Give streptomycin in H. influenzæ and B. coli meningitis.

100,000 units intrathecally every 24 hours. 1,000,000 to 4,000,000 units intravenously every 24 hours, or in divided doses every three hours intramuscularly.

6. Sulphonamide therapy:

For H. influenzæ, meningococcus, pneumococcus, streptococcus viridans, streptococcus hæmolyticus, staphylococcus men meningitis of undetermined ætiology. meningitis,

(a) Sulphadiazine (adult dosage). Ist dose—6 gm. intravenously.

Maintenance dose per day—2 gm. 6 to
8 hours intravenously, or 1 to 2 gm. every 4 hours by mouth.

Sulphamerazine (adult dosage). 1st dose-4 to 6 gm. intravenously. Maintenance dose per day-2 gm. every 8 hours intravenously, or 1 to 2 gm.

every 6 hours by mouth.

(b) Sodium bicarbonate (adult dosage).

Three gm. every 4 hours by mouth, or 1,000 c.c. of 1/6 molar sodium lactate solution every 24 hours, venously.

Biologic therapy:

(a) For pneumococcus meningitis (adult dosage) ype specific antipneumococcus rabbit serum 200,000 or 300,000 units intra-venously during the first 12 hours—after ocular and cutaneous tests for sensitivity. Then 100,000 to 200.000 units per 24 hours until recovery begins.

(b) For H. influenzæ meningitis:

Type B anti-influenzæ rabbit serum 50 to 100 mg. as first dose intravenously. Then 25 to 50 mg. every 24 hours until patient's serum gives capsule swelling reaction with B. influenzæ.

(c) For meningococcus meningitis not responding penicillin or sulphonamides, anti-ingococcus serum intravenously or meningococcus intrathecally.

The Oedematous Syndrome of Nephritis with Special Reference to Prognosis

By J. B. RENNIE

(Abstracted from the Quarterly Journal of Medicine, Vol. 16, January 1947, p. 21)

1. THE pathogenesis of the syndrome of Bright's disease characterized by protracted ædema and albuminuria is briefly discussed.

2. Twenty-nine patients with this syndrome have been observed during the past 16 years. In none was

a history of acute nephritis obtained.
3. The clinical and biochemical changes on admis-

sion to hospital are described.

4. In 1946, 13 patients were alive. Three appeared to be well in every respect 7, 13 and 15 years from the appearance of ædema, and 2, 6 and 14 years afterwards, showed a very faint trace of albumin in the urine as the sole abnormality. Three patients, although free of ædema, showed more marked albuminuria and microscopic hameturic. Of the receiving five three microscopic hæmaturia. Of the remaining five, three were still edematous and two, although free of edema, were showing increasing hypertension.

5. Sixteen patients had died, 12 of uramia, three

of intercurrent infection, and one after an intravenous injection of a mercurial diuretic.

6. All three recoveries were noted in patients in whom hypertension, azotæmia, and hæmaturia were

not observed. 7. Hypertension was the best early indication of a progressive lesion. Out of 14 patients with hypertension when first seen, eight died of uremia and only one of the remainder improved.

The Management of Urticaria due to Penicillin

By D. M. PILSBURY et al.

(Abstracted from the Journal of the American Medical Association, Vol. 133, 26th April, 1947, p. 1255)

URTICARIAL and other allergic reactions to penicillin at times constitute a serious bar to continuance of treatment with this compound. It is to be expected that as more persons receive repeated courses of penicillin a higher incidence of reactions will be observed.

On the basis of general principles applicable to allergic reactions to drugs and of our experience with urticaria due to penicillin, the following scheme of management of such reactions is suggested.

1. Stop the administration of penicillin immediately. except possibly in occasional instances in which there is an immediate critical need on the part of the patient

for the drug.

- 2. Administer benadryl or pyribenzamine in a dosage of 50 to 100 mg. three times a day by mouth to adult patients. The effectiveness or lack of effectiveness of such treatment will ordinarily become apparent within twelve hours. It may be necessary to administer the antihistamine compound as frequently as every four hours, around the clock. If the reaction to penicillin is severe or if it is desired to attempt its administration without interruption, the intravenous administration of benadryl in a dosage of 5 to 10 mg. given slowly in 20 c.c. isotonic sodium chloride solution is advised. The hypnotic effect of its intravenous administration is often decidedly startling, and we are not convinced that it does not possibly have some dangerous potentialities.
- 3. If the urticaria and accompanying symptoms subside, a test dose of 1,000 units of another manufacturer's penicillin may be administered intra-muscularly, provided that facilities for the administra-tion of epinephrine or of benadryl intravenously are at hand. It is recommended that administration of an antihistamine drug by mouth be continued during this period.

4. If there is no reaction to the test dose within six hours, another dose of between 10,000 and 20,000 units may be given. Provided no reaction is evident within four hours, the administration of penicillin may be resumed in full therapeutic doses, with continued administration of the antihistamine compound.

5. The dosage of benadryl or pyribenzamine may be reduced gradually over the next two or three days. If the urticarial reaction recurs, the dose of antihistamine drug should be increased to the level previously found effective. However, in some patients it will be possible to discontinue such drugs entirely while continuing the

administration of penicillin.

6. During the period of trial administration of penicillin, the use of compounds which delay the absorption of penicillin and maintain the level of penicillin in the serum for prolonged periods of time, e.g. penicillin in peanut oil and beeswax, is not advised. Penicillin in a form which will be rapidly excreted, should a reaction occur, is preferable.

7. Should readministration of penicillin be found impossible and should further penicillin therapy be considered highly advisable, as in syphilis, for instance, another attempt at readministration one or more months later may be successful. It is obvious that this should be carried out cautiously, with the patient

under close observation.

8. The prospective wider availability of crystalline penicillin fractions and of improved antihistamine compounds should shortly make the knowledge of the ætiology of reactions to penicillin more exact and the means of preventing and treating them more effective. The problem is one of increasing importance and deserves careful study by laboratory and clinical scientists and by manufacturers of penicillin.

The Minor Virus Diseases

(Abstracted from the Medical Officer, Vol. 77, 1st February, 1947, p. 47;

It is curious that in the military forces during the last war major troubles came from five virus diseases which up to recently were considered of little importance—rubella, mumps, infective hepatitis, atypical pneumonia and mononucleosis. With the exception of atypical pneumonia these are old-established diseases, described in all textbooks but dismissed with scant notices. The five diseases have much in common; they are of low, or insignificant, fatality and their complications and sequelæ, though interesting are rare and of

no great consequence. Or so we thought.
One view of virus diseases which requires consideration, for there is much evidence which seems to support it, is that infection usually occurs in early infancy producing little if any symptom, followed by a permanent symbiosis, generally benign, but liable to explode in characteristic reaction on some kind of activation. Outbreaks of virus disease generally occur without warning, untraceable to their source; they usually are fairly widespread, but selective of certain individuals, and the circumstances are such that case to case infection on the chief factories. tion as the chief factor in spread is out of the question. It may be that the reactors in an epidemic are persons infected for the first time, that in these the virus becomes activated and may induce reaction in contacts in which infection has lain dormant. There seems little doubt that in herpes simplex, the key to the viruses, infection is permanent. Very many persons get a crop of labial herpes whenever they have a cold, usually when the secretion is abundant, but in some usually when the secretion is abundant, but in some persons, herpes may precede the coryza by a few days. Most of the virus infections produce reactions which, though severe at the time, are of strictly limited duration ending in complete recovery unless the nervous system is involved, or the reaction is complicated by bacterial invasion. Reaction is generally followed by a fairly solid immunity. If the virus is eliminated, is the immunity lost? Even if not eliminated, the virus may be reactivated and this may result in another attack of similar reaction—herpes, influenza, cold, etc., or take a different form, possibly an encephalitis? It might also happen that though the symbiosis is generally benign, the strain on the host to maintain it may eventually cause some chronic diseases. Thus, it is suggested that mumps virus may Thus, it is suggested that mumps virus may diseases. Thus, it is suggested that mumps virus may destroy the pancreatic islands and give rise to diabetes; rubella virus may interfere with the development of the embryo. More recently, it has been suggested that the hepatitis virus may produce chronic cirrhosis.

Experimental researches on the viruses leave many matters obscure and some results appear to be contra-dictory of others equally worthy of credence. There is much work for epidemiologists to do in unravelling the mysteries of the virus diseases. Several points we should like to see settled: are persons who have suffered from one virus disease more, less, or equally liable to suffer from others? In outbreaks of one virus disease, is the incidence of others higher or lower than expectation?

Effects of Protein Deficiency on the Pregnant Woman and Fœtus and on the Infant and Child

(Abstracted from the Medical Press, Vol. 217, 4th June. 1947, p. 470)

THE author refers to certain effects which are likely to occur in pregnancy or during growth and develop-ment of the child if protein is deficient in the diet.

During pregnancy and lactation the protein requirements are increased. Part of the protein goes to the development of new maternal tissues such as the uterus and breasts, part to the tissues of the fœtus, the

membranes and placenta. The Food and Nutrition Board of the National Research Council (U.S.A.) recommended 85 gm. of protein daily during the latter part of pregnancy. This figure, of course, presupposes a previously normal protein intake and nutritional state.

Diet during pregnancy—and possibly before—has at least as much to do with a satisfactory supply of breast milk as the diet during lactation. The relation of diet and nutritional state to lactation is a controversial topic, but this tentative generalization is justified—a woman should end pregnancy with liberal stores of nitrogen and she should consume about 100 gm. of protein daily during lactation.

What are the consequences of maternal protein deficiency? Severe dietary deficiency leads to amenor-rhosa and sterility. Evidence has been presented that toxemia of pregnancy occurs oftener in women whose diets are markedly deficient in protein or generally inadequate than in women whose diets are good or who are well supplied with protein.

Again, if the diet is low in protein during the latter part of pregnancy there is a tendency for the infant to be born prematurely or to be relatively immature

at birth. Animal experiments indicate that the fœtus is parasitic only to a degree and that when the mother's protein stores are depleted extensively she appears to

retain her remaining stores of protein, as if some protective mechanism were operative.

In the studies at the Boston Lying-in Hospital on 216 patients, the average length of labour of the primiparous woman was the same in the group with poor diets as in that with good. However, there were many more difficult deliveries in the patients with poor diets than in those with good or excellent diets, although the infants in the former group were on the average 3 lb. lighter. It would appear that the women in the poor diet group were not so fit for labour as the others.

The effects of protein deficiency in childhood are treated in many classic studies and are briefly reviewed by the author. Recent studies, especially in those countries suffering from war restrictions, show that a striking characteristic of the children has been their lassitude and inactivity. The inactivity spares calories but causes failure of normal muscle growth. One of the major characteristics of chronic undernutrition in childhood is poor muscular development, and this has been a striking finding in children of war-devastated or famine countries. Many such children appear super-ficially to be well nourished because they have reasonable amounts of subcutaneous tissue; yet examination shows small and flabby muscles.

Counter-Irritation

By W. H. WYNN

(Abstracted from the Practitioner, Vol. 158, March 1947, p. 185)

In medicine, as apart from surgery, counter-irritation is mainly used to-day in the large group of so-called rheumatic disorders and in certain diseases

of the lungs and heart.

Local application of heat.—Fibrosis and non-specific arthritis are particularly suitable subjects because of arthritis are particularly suitable subjects because of the comparatively superficial position of the lesions and the poor peripheral circulation. In acute lumbago, injection of the localized painful areas with 2 per cent procaine has an immediate effect, in which the acupuncture no doubt plays a part, and this can be followed up with heat. In chronic fibrositis the local appeats the local superthetic will have only a temporary effect but will anæsthetic will have only a temporary effect but will provide an opportunity for firm massage. Heat is the best form of counter-irritation and the choice of method is one of convenience. As most patients are treated at home a simple method which can be used by the patient or unclaided relatives in professible. The by the patient or unskilled relatives is preferable. The application of a hot flat-iron over brown paper has long been a homely remedy and hot sandbags can be

with continuous transmission and one large village with its season from July-August to November were included in the experiments, and 35 villages in Sirsi Taluka were omitted for comparison purposes.

2. A 5 per cent D.D.T. solution in kerosene or light diesel oil was sprayed with knapsack sprayers fitted with nozzles as used in anti-larval oil spray. One quart was sprayed over 1,000 square feet, in human dwellings

3. Spraying was found necessary at intervals of 2 months in some places and 3 months in others. The former frequency is considered safe for general use against fluviatilis.

The total cost works out at Re. 0-8-0 per capita per annum with an average malaria season of about

- months in a year.
 5. The adult fluviatilis prevalence in human dwellings was reduced to 0.08 per 10 man-hours as compared with 2.8 per 10 man-hours before spraying and 2.4 per 10 man-hours in the comparison villages. The total anophelines in human dwellings were reduced to 0.8 per 10 man-hours, as against 13 per 10 man-hours before spraying and 10.4 per 10 man-hours in comparison In the unsprayed animal shelters the total anophelines remained at a density of 89 per 10 man-hours in the experimental and 80 in the comparison villages. There was, however, a slight reduction of fluviatilis in unsprayed animal shelters in the experimental villages (0.5 per 10 man-hours as against 1 per 10 man-hours in the comparison villages).
 6. The spleen rate in the experimental villages was
- 44.0 per cent as against 55 per cent in the comparison area at the end of the malaria season. The parasite rates were 16.3 per cent and 21.5 per cent respectively and the infant parasite rates 3.3 per cent and 32.3 per

cent respectively.

7. D.D.T. thus renders malaria control definitely and economically feasible in the rural and hyperendemic

tracts of Kanara District.

8. The results of a single experiment with barrier spraying are recorded, but the data are insufficient for accurate assessment.

A REPORT ON THE SUCCESSFUL CONTROL OF CULICINE BREEDING IN SULLAGE WATERS BY D.D.T. EMULSION

The successful employment of D.D.T. emulsion for the control of culicine breeding in sullage water is reported.

The presence of neither surface scum, algæ nor

marginal vegetation reduced the efficacy of this method.

3. Emphasis is placed on preliminary trials to estab-3. Emphasis is placed on premimary crass solutions lish the minimum effective dosage applicable to each breeding place.

4. The influence of such factors as the breadth of the nullah, rate of flow and the rate of creaming of the oil phase of the emulsion is discussed.

5. The simplicity of the method, once instituted, is

stressed.

MALARIA AND IRRIGATION IN INDIA

An account is given of the various ways in which the different methods of irrigation practised in India

affect the incidence of malaria.

2 The method of irrigation associated with the greatest amount of malaria in India is that usually known as perennial irrigation, as practised in non-deltaic

areas.
3. The chief source of mosquito breeding and consequent malaria in such systems is failure to provide adequate drainage facilities, thus predisposing to the production of waterlogging, which is detrimental not only to the health of the population but also to the crops.

4. Other causes of irrigation malaria are defective sluice gates and distribution chambers, seepage from canal banks and beds, borrowpits, insufficient bridge crossings and lack of a planned or controlled system

of field channels.

5. It is suggested that in planning future irrigation projects in India, the practicability of introducing a system of intermittent flow be considered.

6. Emphasis is laid on the wide differences which exist between malaria conditions in deltaic and nondeltaic areas. In non-deltaic areas malaria is greatest where the water table is highest, whilst in deltaic areas the reverse is the case. For the prevention of malaria in deltaic areas it is necessary to allow the canals to run full throughout the flood season, to avoid the construction of embankments wherever possible, and to supply as much water as is consistent with the survival of the crops and the capacity of the drainage system.

7. Attention is drawn to the importance of securing co-operation between malariologists and engineers in the planning stage, as well as during and after the

construction of irrigation projects.

8. Provision for antimalaria work should be included as an integral part of the scheme, not only in irriga-tion systems, but in engineering projects of every description undertaken in malarious countries.

On the Relative Efficiency of Hand and Spray CATCHING OF MOSQUITOES

From the data collected in geographical and faunal areas it is deduced :-

(i) These results confirm Ribbands' generalization These results comming misses approximately 28 per that hand catching misses approximately 28 per masquita population. The cent of the house mosquito population. figures relate to very large numbers (26,865) composed of seventeen species, and the close agreement, in spite of the less accurate circum-

- stances under which the work is done, is striking.

 (ii) As regards Ribbands' assertion that males and unfed females are the most likely to be missed in hand catching, our figures show: (a) for pukka houses, a higher proportion of males in the after-spray catches for annularis and pallidus, and a lower proportion in culicifacies. In fluviatilis and subpictus the proportion is the same by both catching methods. No records were made of the abdominal state in routine catches of females. (b) For cattle sheds no species of those present in fair numbers shows a higher male proportion after spraying. By that method there is a definite decrease in fluviatilis and annularis. Both methods yield about the same sex ratio in culicifacies, subpictus and pallidus. Hand catching yields a much lower percentage of the true population than in houses.
- (iii) As here tabulated the data throw no light on Ribbands' contentions (ii) and (iii). From our records, figures on (ii) would be available were there time to do further abstractions. But the 'individual' factor must here play so large a part that, in work such as ours, the authors are inclined to doubt whether the effort would be worth while.

If check catching is to include spraying, and the captures are required for no other purpose than enumerations by species and by sex, it is concluded that preliminary hand catching is rather a waste of effort, and every catch may be commenced by a light spray, the placing of the sheet and a heavy spray as already described.

A different method for checking routine D.D.T. treatment has been introduced recently. A hand catch of living specimens is first made, followed by a search of the floor for dead specimens. The two catches are sorted and recorded separately. The authors are of the opinion that the use of pyrethrum would only complicate results by hiding any different susceptibilities to DDT in individual species which may presently to D.D.T. in individual species, which may presently be revealed by comparisons of the living and dead catches.

An Analysis of a Series of Night Catches of Anopheles

1. The results of 134 night catches, extending over 21 months, are tabulated for the three species most commonly captured, and notes on eight other species taken are offered.

2. A. fluviatilis is shown to be rare in night catches except in October and November, the months of its greatest prevalence in morning catches, and the only months in which dissections reveal infections.

3. Malaria transmission in this area between July and September would appear to be the work of some other species probably culicifacies, in spite of the failure

of dissections to incriminate it.

On the Outdoor Resting of Some Species of Oriental ANOPHELES

1. In three hill districts of East Central India outdoor resting of anopheles is demonstrable in consider-

able numbers.

2. Examination of the abdomens of these catches indicates that a dangerously high proportion of culicifacies and the fluviatilis-group are out of doors at a period in the gonotrophic cycle when they are generally accepted as properly being at their feeding site and so susceptible to spray-killing with pyrethrum insecticide.
3. The anthropophilic indices of certain species, as

found at various catching sites, are set out and the possible import of the differences found discussed.

Anopheline Breeding in Ricefields

(i) In India, when the vector is A. annularis, all rice-

fields are dangerous.

(ii) When the vector is culicifacies, and the transmission period is the south-west monsoon, A. culicifacies is dangerous until the rice plant is more than 12 inches high. But after September the species ceases to be prevalent, whatever the growth stage of the plant. Fallow fields are extremely dangerous.

(iii) When the vector is one or more of the fluviatilisgroup, all non-seepage ricefields are harmless. Seeping ricefields and fallow are very dangerous so long as the

fields are wet.

(iv) A great desideratum is a rice experimental station both in a hill area and in an annularis plains area, when in addition to strictly agricultural trials, methods of controlling vector breeding in ricefields can be studied.

House Spraying with D.D.T.: Further Results

1. Continuation and extension to another village of the authors' preliminary trials with D.D.T. are reported on, up to twenty months in the first case. The ensuing reduction in spleen rates are tabulated and discussed and also reductions in vector density and infection rate.

2. There is some evidence that with continued applications, periods between treatments can be lengthened, but for routine use it is concluded that, with A. fluviatilis as the vector, two-monthly application during the transmission season affords a good margin of safety. Two hypotheses for extension of

efficacy are put forward.

3. Whether a group of houses, when adjacent to an untreated group, can be protected by D.D.T. is considered on the basis of post-collection mortality. The evidence is inconclusive, and the pursuance of this problem is a matter of great economic significance in

industrial hygiene.

4. The spot-resting preferences of various species within the house have been investigated, and data are advanced to show why the fluviatilis-group are more susceptible to D.D.T. than is culicifacies.

5. The increase in time to death with increasing age of D.D.T. is shown. With a deposit nearly 6 months old 9 hours' contact is necessary for 100 per cent

mortality.

6. Stained mosquitoes released in an area sprayed with D.D.T. are recoverable in much fewer numbers, and for a much shorter period, than under normal conditions.

Dental Caries

By H. H. NEUMANN (From the Lancet, i, 7th June, 1947, p. 806)

Reduction of activity below a physiological minimum leads to atrophy in bones, muscles, peripheral nerves,

connected and any organ physiologically mechanical functions. The teeth being part of the bony skeleton, it is reasonable to suppose that they, like bone, react to such disuse with demineralization and atrophy. For various reasons these changes cannot readily be demonstrated in teeth, by either radiography or chemical analysis; but the effects of disuse can be estimated from a world-wide survey of different races living under different dietetic and other conditions. making this survey several factors possibly responsible for caries have to be considered.

Mineral deficiencies.-Poor teeth are found in parts of New Zealand with a low calcium level in the water, in parts of England with a medium calcium level, and in parts of South Africa with a high calcium level. Good teeth were found among natives in Alaska regardless of low or high calcium or phosphorus intake. There appears to be no correlation between calcium and

phosphorus intake and immunity from caries.

Fluorine deficiency.—In South Africa, Kenya, and Australia, dental decay is prevalent among the white people, while the non-assimilated natives of the same places are hardly affected, though using the same drinking-water. Tea has a high fluorine content but does not prevent caries in the English.

Poor mouth hygiene.-Filthy mouths are often free from caries, and no relation is in fact apparent between oral hygiene and caries. The incidence of toothbrushes is often in inverse proportion to that of sound teeth.

Inadequate sunshine. In regions with much sunshine the teeth may be comparatively good (southern U.S.A.) or very poor (South Africa, Kenya, Australia), and in regions with little sunshine the teeth may be good (Eskimos, Maoris in southern New Zealand) or poor (England).

Hereditary factors.—The countries with the worst dental conditions are all inhabited by people of British stock, but a racial influence is disproved by the fact that natives in any part of the globe who fully adopt British food habits acquire dental caries to the same degree as the British. It appears that all human races are equally susceptible to dental caries.

Vitamin deficiencies.—In New Zealand, which has the highest caries incidence in the world, butter, milk, and fresh fruit are abundant, and the population has very good health apart from its teeth. Investigations in the Kangra district of Northern India, where severe malnutrition, rickets, and osteomalacia are extremely prevalent, showed that almost perfect teeth were compatible with severe rickets. In American prisoners-ofwar released from Japanese prison camps after suffering from long-continued multiple vitamin deficiencies and severe malnutrition, the number of carious teeth was less than that of the same age-group living under normal conditions.

Overuse of refined carbohydrates, especially starch. In central and southern Europe, where the teeth are comparatively good, the food is rich in refined carbo-hydrates. In New Zealand, with the worst teeth in the world, proportionally more proteins and less starch are consumed than in most other countries, the diet consisting mainly of meat, eggs, milk, and cheese. On the other hand, protein cannot be held responsible for dental caries, because the Eskimos, who live almost entirely on meat, have sound teeth.

Too much sugar.-In central Europe, where meals ordinarily conclude with a cooked sweet dish, teeth are fairly good. Negroes in the West Indies, who habitually chew sugar-cane, have excellent teeth. The sugar consumption per head is higher in North America than in England, yet American toother. than in England, yet American teeth are much sounder.

Dental disease.--In New Zealand dental disease is rampant among the British population and among those Maoris who have adopted a British diet, but is rare among Maoris keeping to their traditional diet. As already indicated, the British diet in New Zealand shows no obvious deficiency, but a striking characteristic of the food as eaten is its softness. Almost all of it can be small own without magnitation to the all of it can be swallowed without mastication: the meat is thinly cut and taken in small pieces that may or may not be chewed; the breadcrust is usually

removed and thrown away, and proper use of the teeth is considered bad table-manners.

Food eaten with the aid of cutlery rarely requires real mastication, and in civilized society the number of solid foods eaten without cutlery is small. By far the most prominent of them is bread, and it is interesting to compare the dental conditions in various countries in relation to the customary thickness of slices and the types of crust:—

		_	
Country	Thickness of slices, inches	Crust	Teeth
Australasia England United States Central and Eastern Europe. Italy	1 - 2 1 - 2	Soft Soft Mostly soft Tough	Very poor Poor Fair Good Very good

Prevention of caries.—In osteoporosis or bone atrophy there is 'abnormal porousness of the bones by the enlargement of the Haversian canals and by the formation of cavities; the atrophic changes in many instances are caused solely by disuse'. I suggest that the pathological condition underlying dental caries is similar—a disuse odontoporosis. If so, the importance of tough food for the teeth lies in the prevention of decalcification from disuse, and not in its detergent action, which is limited to a fraction of the tooth surface and affects least the places where food lodges and ferments. In primitive peoples with a low caries incidence the teeth are often very dirty; the incidence of salivary calculus and of dental plaques may be high and the bacterial flora in the mouth abundant. Frequent and careful cleansing of the teeth does not appreciably diminish caries: the toothbrush is ubiquitous and victorious, but caries flourishes more than ever.

The accepted modern nutritionally sound diet, with well-balanced minerals, vitamins, and calculated ingredients, seems to have no bearing on immunity to caries. This is in line with the well-known fact that an increased supply of minerals and vitamins cannot remineralize a bone decalcified from disuse; it can be done only by active use of the limb. Similarly, the prevention of dental caries requires the addition to the diet of tough matter. The addition of some hard breadcrust (old Swedish or Italian type bread) to the daily diet would suffice to maintain fairly good teeth with a reasonably low caries incidence. Carrots, celery, apples, and fruit generally are of little use in this regard; biscuits, cracking hard food, and toast are still less suitable; while chewing-gum is too elastic and soft. Chewing of sugar-cane has been found useful in the treatment of odontoporosis, but great care must be taken at first, because some of the atrophic teeth may break. If rice is the staple food the prevention of caries demands the consumption of undercooked rice, leaving the grinding of the grains to the teeth. Where this is the custom, as in parts of the Philippines, the teeth are excellent; whereas in parts of China, where the rice is well cooked, the teeth are poor.

After a lifetime of chewing the teeth may be ground down and shortened, as in old horses, but are free from caries. In fact, attrition and dental caries occur in reverse relationship; they usually exclude each other. except when the attrition reaches the pulp cavity and further chewing becomes painful.

Conclusion.—Reviewing the factors commonly blamed

Conclusion.—Reviewing the factors commonly blamed for endemic dental decay—such as mineral deficiencies, fluorine deficiency, poor dental hygiene. inadequate sunshine, constitutional factors, vitamin deficiencies, and overuse of starch and sugar in the diet—I conclude that they have little effect on endemic dental decay, and do not explain its peculiar geographical distribution. The consistency of the food, the table-manners of the

people, and the extent to which cutlery is used are far more important.

The disuse odontoporosis which leads to dental caries can be prevented—and to some extent treated—by restoring to the teeth their proper work of chewing. Though there is little immediate hope of getting the white man to eat tougher food generally, this major deficiency of modern diets can be largely corrected by adding sufficient 'toughage' to what we eat.

Reviews

TEXTBOOK OF SURGICAL TREATMENT INCLUD-ING OPERATIVE SURGERY.—Edited by C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.E. Third Edition. 1947. E. and S. Livingstone, Limited, Edinburgh. Pp. xii plus 644, with 269 figurés. Price, 32s. 6d.

An extremely useful and attractive handbook which has improved in the third edition. The different aspects of disease, injuries and treatment are expressed in an authoritative manner as may be expected from the list of experienced contributions. It is especially helpful for ready reference on almost all problems that may come to an aspirant to a career of surgery. Descriptions and directions are lucid and to the point. Only one would have liked to have seen some mention made about difficulties and pitfalls that may be met with. As an example, describing the incision for the exposure of the kidney the incision planned is far backwards at the upper end where the downward reflection of the pleura may be met with and may be, in danger of injury. Similarly an aberrant renal artery may also be present and attention to this might have been drawn.

The illustrations are particularly attractive and easy to understand. The chapter on rehabilitation is a valuable contribution and opens up many problems which may be tackled with the ingenuity of the reader.

L. M. B.

A SHORT TEXTBOOK OF SURGERY.—By C. F. W. Hillingworth, C.B.E., M.D., Ch.M., F.R.C.S. (Edin.). Fourth Edition. 1947. J. and A. Churchill' Limited, London. Pp. vill plus 680, with 12 plates and 227 text-figures. Price, 30s.

An admirable textbook for students which avoids, as mentioned in the preface to the first edition, 'Encyclopædic unwieldiness of compilations' and at the same time deals comprehensively with the subject it treats. It is very readable and the student specially will find in it all that he is required to know at this stage of his career. As one reads on, the freshness of approach on the description of surgical affections and their treatment is attractive—though from the standpoint of the standards of the older textbooks, one may wish for a little fuller and more detailed information—perhaps desirable for the demands of querulous and exacting examiners in surgery from students appearing for their final examinations. On the whole, the author has been wise to limit his subject-matter in the form in which it appears. In this edition almost all the accepted advance in the knowledge of surgery is mentioned and one has only to refer to larger books to gather details. It should be a very popular textbook.

L. M. B.

PRACTICAL ANATOMY.—By W. E. Le Gros Clark, M.A., D.Sc., F.R.S., F.R.C.S. 1948. Edward Arnold and Company, London. Pp. xvi plus 470. Illustrated. Price, 25s.

A very useful handbook for students who require a workable knowledge in anatomy for the qualifying medical examinations. There is an exhaustive preface which explains the necessity of a book which will avoid

minute details and lessen the labour of the student in acquiring sufficient knowledge of anatomy to satisfy the medical curriculum. There has been going on for some time the discussion as to whether the teaching of anatomy as was done elaborately to give a sound foundation to the student for preparing himself for medical science, should not be curtailed materially in order to lighten the burden on him made heavy and almost unwieldy by the introduction of specialized subjects. The question will be decided after experience has been gathered for a few years. The book under leview contains a mass of information which is extraordinarily compressed in a volume of this size. The information is well laid out in a systematic manner and will afford the students much help in their dissections. It appears to be a further development improved considerably of another book which Wright and Parsons brought out about 30 years ago and which is mentioned in the preface of this work.

The book ought to be useful and popular with the

students.

L. M. B.

BUCHANAN'S MANUAL OF ANATOMY.—Edited by F. Wood Jones, D.Sc. (Lond., Adelaide and Melb.), M.Sc. (Manch.), M.B., B.S. (Lond.), F.R.S., F.R.C.S. (Eng.). Assisted by E. L. Patterson, M.D., B.Sc. (Manch.), et al. Seventh Edition. 1946. Ballière, Tindall and Cox, London. Pp. vill plus 1616. Illustrated. Price, 45s.

Tm: new edition of this well-known work contains some new innovations. The old scheme of regional description is maintained which makes it different from other well-known books on anatomy. This scheme has its advantages as well as its disadvantages inasmuch as one has to turn to different regions to follow the whole course of a structure which traverses different regions. The descriptions of structures are terse and easy to follow. The diagrams are practically all original and many new ones have been added. These are clear and true. A new feature is inclusion of several skingrams which beautifully display structures giving shadows in their original relations. The organogenesis portion has been shortened, thus involving consultation of a more elaborate work on the subject. It is a textbook popular among students of anatomy and they will welcome the new features in this edition.

L. M. B.

GARDINER'S HANDBOOK OF SKIN DISEASES.—
Revised by John Kinnear, O.B.E., T.D., M.D.,
M.R.C.P. (Edin.), D.L. Fifth Edition. 1848.
E. and S. Livingstone Limited, Edinburgh. Pp. xv
plus 250. Illustrated. Price, 15s.; postage, 6d.
(home)

Messes. E. and S. Livingstoni. Ltd. deserve congratulation for the new edition of this little book for the beginners. Many important informations from secent works have been given and the appendix will be found very useful.

This is a good book for the nurses and students for whom it is intended although it cannot be classed as a standard book on dermatology.

The printing and get-up are good.

L. M. G.

THE PRACTICE OF MENTAL NURSING.—By M. Houliston, R.G.N., R.M.N.; R.F.N. 1947. E. and S. Livingstone, Limited, Edinburgh. Pp. xl plus 164. Price, 7s. 6d.

An invaluable aid for new entrants of mental nursing. A good guide to any nurse attending neurotic patients.

C. M. A.

A HANDBOOK FOR NURSERY NURSES.—By A. B. Muring, S.R.N. 1947. Baillière, Tindall and Cox, London. Pp. xi plus 609. Illustrated. Price, 17s. 6d.

RECOMMENDABLE for nursery nurses in training, also very helpful in the homes of young children.

C. M. A.

ELEMENTARY HYGIENE FOR NURSES: A HAND-BOOK FOR NURSES AND OTHERS.—By H. C. Rutherford Darling, M.D., M.S. (Lond.), F.R.C.S. (Eng.), F.R.F.P.S. (Glas.). Ninth Edition. 1947. J. and A. Churchill Limited, London. Pp. vill plus 296. Illustrated. Price, 7s. 6d.

A userul, book for 1st year nurses or preliminary training school. Illustrations instructive.

C. M. A.

MEDICAL RESEARCH COUNCIL. SPECIAL RE-PORT SERIES NO. 257. A STUDY OF INDIVID-UAL CHILDREN'S DIETS.—By E. M. Widdowson. 1947. Published by His Majesty's Stationery Office, London. Pp. vii plus 196. Illustrated. Price, Gs.

Dirtary surveys are usually carried out on groups of persons in institutions or families by measuring the food consumption and working out the average by simple calculation. Although useful for some purposes, the method does not give any picture of what an individual child cats, nor does it show the variations between one child and another. Dr. Widdowson's report differs in that she investigated the diets of individual children, what food, in kind and quality, was actually consumed by each child in selected groups. The method employed was to weigh the food eaten over a period of one week by each child and calculate its chemical composition from food tables. At the same time the heights and weights of the children were measured and frequently also the blood and teeth were examined. In this way data were collected from over 1,000 British children, most of them coming from middle class' homes. At least 20 boys and 20 girls were investigated at every year of age from 1 to 18, thus covering the whole range of childhood. They were healthy children, but for comparison some who were diabetics or the offspring of impoverished parents were included within the scope of this study. It must have been a very laborious task to collect the data and analyse the results which are presented in this report. While these should be of value to those concerned in the feeding of children, the one outstanding fact that emerges from this investigation is that similar individuals may differ enormously in their food habits. In each age group studied, for instance, there was always one child who ate as much as another, and similar differences were found when children of the same height and weight or surface area are compared. And yet such variations may be compatible with good health and average physical development. The findings indicate that individual requirements must differ as much as individual intakes and that an average intake should never be used to assess an individual's require-ment. The report which has been prepared with great care may open up new lines of research in the field of nutrition and should be a model to those undertaking dietary investigations in this country.

R. N. C.

DIE HORMONVERSORGUNG DES FŒTUS.—By Dr. Jules Samuels. 1947. E. J. Brill, Leiden, Holland. Pp. 320.

In this book the author discusses the hormonal supply of the fectus. However the discussion is limited to the activity of the secretions of the anterior lobe of the hypophysis and to the anterior-pituitary like secretions of the placenta. Dr. Samuels concludes that these substances are not only activators of cell-proliferation, but he believes them also to be the growth factors of the fectus. The author is of the opinion that the first stage of fectal development is under the hormonal influence of the maternal anterior pituitary, while formation of the chorion and of the placenta initiate the second stage of development which is regulated by the hormonal secretions of the placenta. The latter produces some anterior-pituitary like hormone, the action of which is similar to that of progesterone

the action of which is similar to that of progesterone. The author states that only two, and not several hormones are produced in the anterior adenohypophysis, i.e. the basophil cells secrete a gonadotrop hormone

and the eosinophil cells produce a thyreotrop hormone which has luteinizing functions. The field of hormones is still under investigation. This book is rather controversial, as one cannot accept all the conclusions of the author, but it should be of interest to the specialist. The book contains more than 500 references. A summary in German, English, French and Dutch is appended, and this is a useful feature, though the translations are rather poor.

S. J. G.

BOOKS RECEIVED

THE Pharmaceutical and Allied Manufacturers' and Distributors' Association, Limited. (Founded 30th November, 1939. Incorporated 25th May, 1940.) Annual Report for the Year 1947-48 and Audited Accounts for the Year ended 31st December, 1947. Printed by G. Claridge and Co., Ltd., Bombay. Registered Office:—Savoy Chambers, Wallace Street, Fort, Bombay.

Correspondence

TREATMENT OF SCABIES WITH D.D.T.

.SIR,—I use 5 per cent D.D.T. just as it is supplied in bottles; a swab stick dipped in this applies to all the sores.

At present I have prepared an ointment of D.D.T. powder in peanut oil. Hope this proves satisfactory. So far no patient has complained of toxic symptoms.

Liquid paraffin or vaseline can also be used for preparing the ointment.

Yours truly, D. HARI.

RABULKHANJI ZANANA HOSPITAL, RAJROT.

Any Questions

INFANTILE DIARRHEA

Sm.—In the course of my private practice I occasionally found that cases of infantile diarrhoa were often due to some fault in the milk of the mother's breast. There is a common belief among the rural people that infantile diarrhoea is due either to the seasonal wind or to the milk of the mother or to both. Investigation in a number of cases revealed that in some cases the secretion of milk was excessive, the mother apparently remaining perfectly healthy. The first mother whom I treated instead of the baby for its diarrhea had anæmia and some constipation and a saline purgative and iron brought about a magic cure of the diarrhea. Subsequently I tried the same trick of the diarrnea. Subsequently I tried the same trick in similar cases, all with success, except those with helminth, giardia or E. histolytica. Some infants required sulphaguanidine. Cases that responded on treating the mother had simple diarrhea: the stool—normal in colour, reaction—acidic, consistency—liquid to semi-liquid, number of motions—variable. Sometimes the diarrhea was associated with tympanites of treating degrees. varying degrees.

Would you very kindly let me know the ætiology and pathology of the mother's condition?

Yours sincerely, H. THAKURIA, B.A., L.M.P.

TIHU, Assam.

[Dr. Thakuria quotes two reasons that are thought to be responsible for the diarrhæa in infants: (1) Seasonal wind, and (2) mother's milk.

We do find the diarrhoea in infants seasonal in rural area. But it is not due to the wind but the water. As most of the people drink water from open wells and tanks during rainy season, chances for infections are more. If children are given unboiled water there is the chance of more cases of diarrhea in this part of the year.

About the mother's milk, I feel it is the quality that is effecting them. As our mothers feed babies, often at too frequent intervals, the child might get indigestion if it takes in too much milk. Because of this it can have diarrhœa.

Decreasing the quantity of milk by saline purgatives is bound to help in the cure as it gives some rest to the child's intestine.

Our experience shows that this kind of diarrhoea is possible but the number of cases are very few. Unless Dr. Thakuria gives some statistical information as to

Dr. Thakuria gives some statistical information as to the number of cases he treated in this way, and the result of this and other kinds of treatment, it is very difficult to judge the special usefulness of this treatment. We resort to regulating the diet of the child instead of giving purgative to the mother.

I don't exactly understand what he means by 'exiology and pathology of the mother's condition'. I only like to mention that we know that nutrients in the mother's milk will depend a lot on her diet. Also some drugs can be transmitted through milk. The effect of pathological conditions in the mother on the child through the breast milk has not been quoted to my knowledge. to my knowledge.

M. S.1

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The

Indian Medical Gazette

TRAGEDY NUMBER

A TRACEDY the like of which had not shocked the world for 1,915 years enveloped India in gloom on the 30th January, 1948! Medical men are affected like other men. Medical India mourns.

The Indian Medical Gazette is bringing out a special number in two months' time. Contributions are invited on all subjects which mitigate suffering and thus would have found favour with the Mahatma.

The following subjects are suggested:-

Psychology of lesser men, men and supermen. Social fabric, population pressure, poverty and misery. Crime and punishment. The irresistible impulse.

Juvenile and senile delinquencies.

Capital punishment.
Hanging as capital punishment.
Shooting as capital punishment.

Preservation of human dignity and liquidation of unwanted life.

Euthanasia.

- Operation for abortion. Killing and callousness. 11.
- 13. Humane slaughter.
- Food, gluttony and fasting. Stimulating drugs, their use and abuse.

- Beverages, intemperance and prohibition.

 The present system of education in general and medical education in particular.
- 18. Span of human life.

Contributions are not limited to medical men only: Veterinary sur-geons, missionaries, lawyers, educa-tionists and social workers are also contributing.

Original Articles

PRESUMPTIVE MALARIAL PNEUMONIA

By ROBERT HEILIG, M.D., F.N.I.

Chief Physician

With the assistance of GULAB CHAND SHARMA, L.M.P., D.M.R. (Madras)

Assistant Radiologist, S. M. S. Medical College Hospital, Jaipur

In India most of the non-tuberculous inflammatory diseases of the lungs are due to pneumococcal infections, responding promptly to sulpha drugs and requiring rarely penicillin treatment, especially as we do not consider a low leucocyte count, an absolute contraindication for using sulpha drugs (Heilig and Visveswar, 1943). Lung syphilis in adults is extremely rare here (Heilig et al., 1942) and so is rheumatic pneumonitis (Heilig, 1946), which in our case showed an immediate response to salicylates. Atypical pneumonias, apparently benefited by intravenous administration of hexamethylene

treatment was carried out in such a way that the effects of sulpha drugs and penicillin on the pneumonic process could be clearly distinguished from those of antimalarial therapy.

Case report 1.—On 22nd December, 1946, Mangli, a Brahmin woman, 35 years of age, was admitted to hospital with a history of delivery 3 weeks ago, followed after 4 days by fever lasting for a few days. Her complaints were fever with cough and pain in the right side of the chest for the past 3 days. Physical examination confirmed by x-ray fluoroscopy revealed a pneumonic consolidation of the entire right upper lobe. Spleen just palpable. Temperature on admission 101°F.; pulse rate 115; respiration 42; leucocyte count 8,500; neutrophils 76, lymphocytes 18, monocytes 6 per cent. E.S.R. 64/95 (Westergren). Malaria parasites: B.T. rings very few; malaria flocculation test (M.F.) + positive. Sputum: negative for tubercle bacilli.

From 22nd December to 29th December, 1946, treatment consisted of sulphadiazine 2 to 3 gm. a day and hexamethylene tetramine daily 4 gm. intravenously. Her temperature (figure 1) touched 98.4°F. almost every day and the

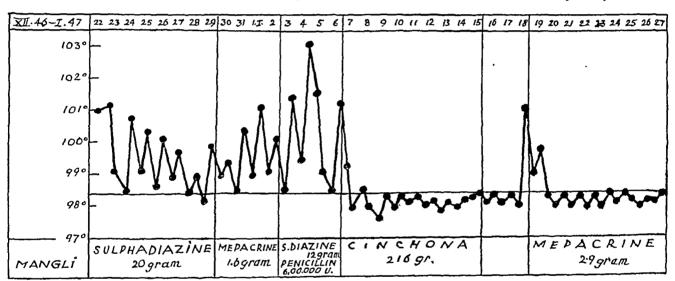


Fig. 1.-Case 1. Temperature chart.

tetramine, are seen infrequently. More often occur lobar pneumonias so closely associated with malaria that overlooking of this co-existent factor might have serious consequences for the patient (Heilig, 1945). And yet, this important group of pulmonary affections is so little known that in spite of several papers on this subject (cf. Applebaum and Shrager, 1944), the practical importance of malaria complicating pneumonia and making it sulpha drug-resistant does not seem to be generally realized, and malaria is not considered a factor which might determine the course as well as prognosis and treatment of lobar pneumonia.

Out of a total of 64 cases of pneumonia complicated by malaria, of which 38 were seen in Mysore (1940-43) and 26 in Jaipur (1943-47), only those are reported here in some detail whose

maximum steadily decreased, but after 20 gm. sulphadiazine and 6 urotropine injections the fever rose again to 100°F., the pulse rate remained at 120, the lung signs failed to show any improvement and the leucocyte count rose to 10,000.

Because of the signs of malaria found on admission and the remittent character of the fever, mepacrine was given 0.4 gm. a day from 30th December, 1946 to 2nd January, 1947. Administration of 1.6 gm. (16 tablets) failed to induce any improvement of fever, pulse rate or physical signs, and x-ray examination showed a small translucent patch in the centre of the opacity like the beginning of a lung abscess. Therefore, mepacrine was stopped and on 3rd January, 1947, penicillin injections were started with 30,000 units and continued with 20,000

units every 3 hours day and night, accompanied by sulphadiazine 3 gm. a day. After 4 days of this regime when 600,000 units of penicillin and a total of 32 gm. sulphadiazine had been given, the fever rose to 102°F. and the condition of the patient caused anxiety. The findings (6th January, 1947) showed clinically and 1946, violently delirious with a massive pneumonic consolidation of the whole left lung, confirmed by fluoroscopy. Spleen was palpable 2 fingers below the costal margin. Pulse 140, temperature 100°F. (figure 2); leucocytes 20,000, neutrophils 78, lymphocytes 17, monocytes 5 per E.S.R. 56/85 (Westergren). M.F. +

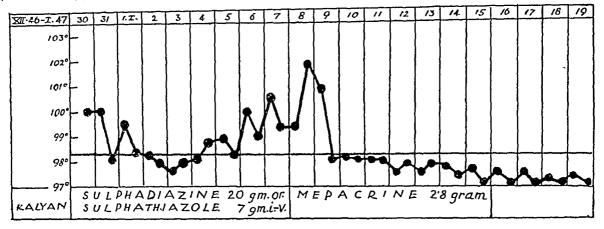


Fig. 2.-Case 2. Temperature chart.

radiologically no improvement; leucocytes 6,000; sputum showed no abnormality. The size of the spleen had increased by one finger and M.F. was now ++ positive.

The absolute resistance to sulphadiazine and penicillin, the remittent type of the fever and the increase in the size of the spleen induced us

to try once more antimalarial therapy.

On 7th January, 1947, we put the patient on a mixture of cinchona febrifuge 6 gr. four times a day, and the fever which had persisted for weeks subsided overnight; cinchona was given for 8 days up to a total dose of 216 gr. The temperature remained normal as long as cinchona was given and for 3 days after its administration had been stopped. Her lung condition improved quickly. On the 4th day (19th January, 1947), the temperature rose suddenly to 101°F.; we started mepacrine once more, this time giving a full course of 28 tablets. Since then the patient remained completely afebrile for at least one month, i.e. as long as she remained under observation. On 31st January, 1947, three weeks after the beginning of cinchona therapy, physical and x-ray examination showed not a trace of the consolidation. Her hæmoglobin rose from 46 to 68 per cent, E.S.R, decreased from 64/95 to 12/23 (11th February, 1947) and the leucocyte count, which had been 8,500 on admission, was 10,000 on 28th December, 1946, 6,000 on 7th January, 1947, and 5,200 on 11th February, 1947. We could hardly keep her long enough for full observation as she felt impatient to return to her family. We had to discharge her on 14th February, 1947, but saw her once more on 20th February, 1947, in perfectly normal condition. Case report 2.—Kalyan, a Hindu merchant, 50

years of age, was admitted on 30th December,

positive. He was put on sulphadiazine, first 8 tablets, then 6 tablets a day, and sulphathiazole 1 gm. intravenously every day, niacin (pelonin) 2 c.c. intravenously twice a day, and circulatory stimulants. Under this treatment his pulse somewhat improved, temperature gradually approached normal but the consolidation of the lung showed little change and his mental condition, if anything, became worse, so much so that he climbed over the bed rails and walked off some 500 yards to the public gardens, where the hospital staff picked him up. After having had 40 tablets (20 gm.) of sulphadiazine and 7 intravenous injections (7 gm.) of sulphathiazole, his temperature rose to 102°F. and his general condition deteriorated rapidly, while the pulmonary status remained unchanged.

A blood smear prepared at the height of this last temperature rise showed some B.T. rings. His spleen being moderately enlarged and M.F. positive at this stage mepacrine was started 2 tablets every 8 hours up to 12 tablets, followed by 1 tablet thrice a day up to a total of 28 (2.8 gm.). The result was most surprising; after 24 hours of antimalarial treatment, this man who had been delirious continuously for one week, became conscious and reasonable, asked for food and chatted with his neighbour. After 36 hours his temperature touched normal and has remained so for one month. Opacity and tubular breathing gradually disappeared and on 29th January, 1947, 3 weeks after the starting of mepacrine treatment, he was discharged, keen on resuming immediately his work as a shopkeeper.

Case report 3.—Bargi, a Hindu female, aged 55, was transferred on 26th March, 1947, from the ophthalmological unit where she had been operated upon for cataract of the right eye on 18th March, 1947. On 23rd March, 1947, her temperature suddenly rose to 102°F. (figure 3); on the following day, I was called in for consultation and diagnosed a massive pneumonic consolidation of the left lower lobe. Leucocytes

was 100°F. on the first two days of cinchona therapy and 99°F. on the third day. From the fourth day (8th April, 1947) up to the day of discharge on the 20th, the temperature remained normal. Still more impressive was the effect on

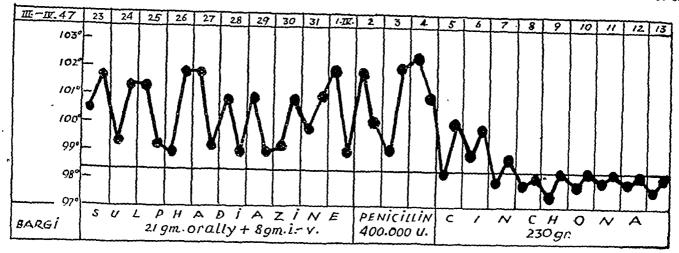


Fig. 3.—Case 3. Temperature chart.

13,000, neutrophils 76, lymphocytes 20, monocytes 4 per cent. Patient was severely ill and suffered from toxemic vomiting. From 24th March to 1st April, 1947, she received 42 tablets (21 gm.) sulphadiazine orally and 8 sulphadiazine injections (8 gm.) with glucose intra-venously; on 31st March, she lapsed into a delirious condition which was treated with niacin 100 to 200 mg. daily intravenously; within four days 1,200 gm. was given. within four days 1,200 gm. was given. After a total of 29 gm. of sulphadiazine the lung condition showed no improvement, the temperature was still 102°F., pulse rate 130, leucocytes 12,000 and the general condition serious. Therefore on 1st April, 1947, penicillin treatment was started with 40,000 units and continued with 20,000 units every 3 hours by intramuscular injections. On the 4th, after 400,000 units, the temperature was 102°F., pulse 136; the lower half of the left lung area was stony dull. There was fairly loud tubular breathing, and vocal fremitus and resonance were moderately increased. We suspected the development of an empyema; but on aspiration no fluid was found.

Guided by the resistance of her lobar pneumonia to sulphadiazine and penicillin, a previous history of occasional malarial attacks, the presence of a moderately (2 fingers) enlarged spleen and a positive malaria flocculation test, antimalarial treatment was started, although plasmodia were not found; every other treatment, except for camphor injections, was stopped.

plasmodia were not found; every other treatment, except for camphor injections, was stopped.

On 5th April, 1947, we put her on cinchona febrifuge 6 gr. every 2 hours daily for 4 doses, and continued this treatment with the same dosage up to 13th when 230 gr. had been given. The temperature chart shows the almost unbelievable effect; the temperature maximum which had been at least 102°F. for four days prior to the beginning of antimalarial treatment

the general and the lung condition. Although niacin (pelonin) had controlled the delirium, the patient had remained dull, unresponsive and doubtfully orientated up to the end of penicillin treatment. On the second day of cinchona administration she clearly replied to questions, asked for food and eagerly acknowledged her improvement. Her tongue which had been dry and furred since we had seen her first, quickly became clean and moist, pulse rate fell from 135 to 90 within 3 days and, most surprising of all, the lung consolidation which had not shown the slightest tendency to resolution, clinically or radiologically, for 12 days in spite of full doses of sulphadiazine and penicillin started melting away. Redux crepitation audible within 36 hours of antimalarial treatment. After 3 days, on 8th April, 1947, a skiagram (figure 1, plate V) showed diminishing density of the opacity. On the fifth day of cinchona therapy, her leucocyte count was 3,000. On the 14th day after the beginning of antimalarial treatment, both the lung fields were almost clear, clinically as well as radiologically (figure 2, plate V). In four weeks from the onset of the pneumonic consolidation, a fortnight after the standard treatment with sulphadiazine and penicillin had been stopped and cinchona medication was started, at a moment when the patient's condition seemed almost hopeless, the patient had fully recovered, remaining afebrile and mentally alert from the third day of antimalarial therapy. A course of mepacrine was given after she was discharged from the hospital.

Case report 4.—Naraini, a Hindu female, 40 years old, was admitted on 3rd November, 1947, complaining of cough for 3 months and high fever for about one week. Clinical examination revealed a consolidation of the right upper lobe. X-ray showed a triangular opacity of the basal part of the right upper lobe and some ill-defined

haziness of the medial angle of the right lower lobe. Leucocyte count 14,800; E.S.R. 66/98 (Westergren). Sputum was consistently negative for acid-fast bacilli, and so was Mantoux tuberculin skin test. Temperature on admission was 102°F. (figure 4), pulse rate 130. Treatment consisted of sulphadiazine 3 gm. daily

(7th November, 1947), taken just when sulphadiazine was stopped while einchona had not yet been given, represents exactly the same condition as was found on admission, thus excluding any tendency to spontaneous resolution. Figure 4, plate V (13th November, 1947), shows the condition six days later at the end of a course

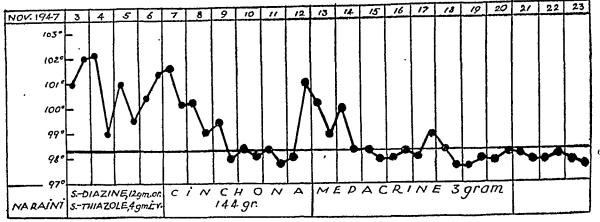


Fig. 4.—Case 4. Temperature chart.

and thiazinamide 1 gm. by intravenous injection. After four days, of this medication, her temperature still rose to $101.5^{\circ}F$, with a pulse rate of 120, respiration 43. Physical signs and x-ray appearance showed no improvement (figure 3, plate V) and the clinical condition was considerably worse.

Repeated interrogation elicited a history of occasional slight fever for the last two years; spleen and liver were not palpable; fever was intermittent. Malaria flocculation test was positive and prolonged search of several blood smears showed malarial pigment but no plasmodia. On the fifth day after admission, after 12 gm. sulphadiazine had been given orally and 4 gm. sulphathiazole intravenously, sulpha drugs were discontinued and cinchona febrifuge 6 gr. every 2 hours daily for 4 doses was started at a temperature of 101.5°F. Within two days the fever subsided and the patient remained afebrile and improved satisfactorily for two days more. On the third day (12th November, 1947), after 144 gr. cinchona had been completed, she felt a chill and her temperature shot up to 102°F. From then onwards mepacrine was given instead of cinchona; the dosage was 2 tablets every 8 hours up to 12 tablets, followed by 1 tablet thrice a day up to 30 tablets (3 gm.). Twelve menacrine tablets stopped the fever and the patient remained afebrile up to the date of writing this report (23rd January, 1948). By the end of the mepacrine course her leucocyte count was 6,700 and her E.S.R. 34/74, a figure reduced to 16/35 one week later.

The most convincing proof of the curative effect of antimalarial therapy, apart from the fever chart, was established by the series of x-ray photos taken at short intervals. Figure 3, plate V

of 144 gr. cinchona, on the day following the isolated temperature rise to 102°F., prior to starting a full course of mepacrine. Finally, figure 5, plate V (27th November, 1947), seven days after mepacrine and every other medication was stopped, and 20 days after antimalarial treatment was started, shows clear lung fields.

Case report 5.—Panchia, a Hindu villager, 40 years of age, was admitted on 10th November, 1947. He gave a history of 8 days' fever with hemoptysis and pain in the right side of the chest. Examination revealed a severely ill, underweight, middle-aged man; there was an intensive dullness on the right side from apex to base in front and back with loud tubular breathing. Liver was not palpable; spleen on deep inspiration just palpable. Temperature 101°F. (figure 5); pulse 130 to 140; respiration 48. Leucocytes 5,500, neutrophils 70 per cent, lymphocytes 26 per cent, monocytes 4 per cent. Blood examination for malarial parasites was negative on 10th, 13th and 18th. Sputum contained large numbers of red blood cells and the usual bacterial flora. On x-ray fluoroscopy (figure 6, plate V), a dense homogeneous opacity was seen on the right side reaching from the to the diaphragm, which hardly showed any respiratory movement. Heart and mediastinum were slightly pulled to the affected side. The left lung field was clear.

Treatment was started with sulphadiazine 3 gm. a day, reinforced by sulphadiazine 4 c.c. = 1.0 gm. daily by intravenous injection; this was continued in decreasing doses for 7 days when 15 gm. sulphadiazine had been given orally and 5 gm. intravenously. By this time (17th November, 1947), no improvement had been achieved; temperature still reached 101°F., the pulse rate was 130 to 135, respiration varied

between 42 and 48. Leucocyte count fluctuated between 5,000 and 7,200. The sputum still contained blood and E.S.R. rose from 27/59 to 48/95. The general condition steadily deteriorated; the patient felt so weak that he could hardly drink milk or barley water; he was lying on his back, sighing continuously and rarely replied to questions.

On 18th November, 1947, on the 17th day of illness, the x-ray photo (figure 6, plate V) showed exactly the same condition as was seen on admission. The same day sulphadiazine medication was stopped and antimalarial treatment started with cinchona febrifuge 24 gr. a day, divided in 4 doses; after 24 hours of this treatment the temperature maximum was 99°F., although the pulse rate still ranged between

we were unable to satisfy his appetite and had to discharge him (28th December, 1947). But one week later we set out for his village and brought him to hospital for follow-up radiography (figure 8, plate VI), which showed that the clearing of the opacity progressed satisfactorily. Eight weeks later (27th February), another skiagram (figure 9, plate VI) showed further clearing of the massive consolidation.

Finally, for comparison, we add the report of a case suffering from a proved M.T. infection accompanied by pneumonia which spread to the other lung in spite of antimalarial treatment. This case, therefore, could not be called one of malarial pneumonia, but a pneumonia associated with malaria, meaning that both these infections co-existed independently of each other.

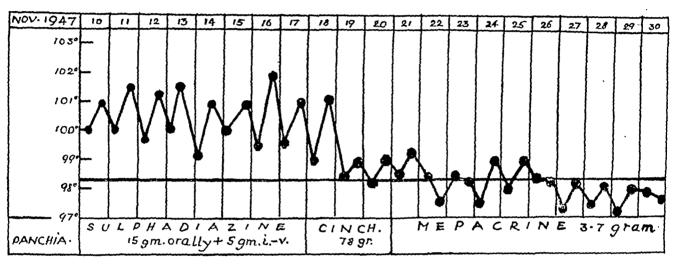


Fig. 5.—Case 5. Temperature chart.

110 and 120 and respiration around 40. To prevent the short recurrence of fever, seen in many cases who had been treated only with cinchona, after 3 days (78 gr.) of cinchona administration, we changed to mepacrine. The temperature remained practically normal ever since. Because of the unusually massive consolidation, we pushed mepacrine up to 37 tablets. The leucocyte count gradually rose from 10,300 to 14,600 per c.mm. and finally dropped to 8,200 on 28th December, 1947. The differential count remained normal with a few eosinophils appearing on 26th November, 1947. Clinical examination revealed gradual resolution with diminishing of the hard dullness and appearance of crepitation. On 27th November, 1947, the first râles were heard over the middle lobe. X-ray (figure 7, plate VI) confirmed the physical findings. The improvement of the general condition went almost parallel with the temperature chart and far outpaced the improvement of the pulmonary process. Three to four days after antimalarial treatment was started, the patient was able to sit up and soon he was the most voracious eater in the ward; the speed and completeness of his recovery was a spectacle which staff, patients and visitors, who had seen him as a dying man, never tired of admiring. Finally

Case report 6.—Beejay, a Hindu male, 30 years old, was admitted on 28th January, 1948, with a pneumonic consolidation of the right lower lobe, confirmed by x-ray, and M.T. rings in his blood. After 8 tablets of paludrine which was given at the rate of 6 tablets a day, the temperature which was 101.5°F. on admission (figure 6) touched normal and remained so for 48 hours. On the 5th day of paludrine medication when 26 tablets had been given, the temperature rose again to 101°F. and signs of a pneumonic consolidation appeared on the other, in the left side. At this stage, in addition to paludrine which was continued up to 30 tablets, two quinine injections 6 gr. each were given. After the second injection the fever reached 102°F., x-ray showed in addition to the initial consolidation of the right side, an opacity of the lower two-thirds of the left lung field while the leucocyte count was 14,000. Antimalarial treatment was stopped and sulphadiazine given intravenously and orally. Improvement was almost immediate, but owing to the involvement of three lobes, the late start of proper therapy and the fact that this patient was an alcohol addict, it took 5 days to achieve afebrility and full resolution; x-ray showed some haziness even after a fortnight.



Fig. 1.—Case 3, B., 8-4-47.
Third day of antimalarial treatment.

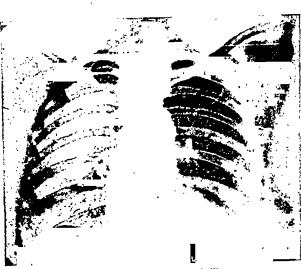


Fig. 2.—Case 3, B., 18-4-47. After cinchona, 230 gr.

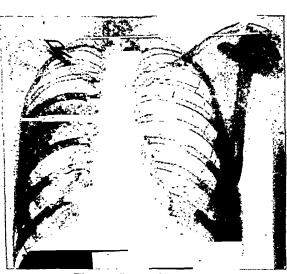


Fig. 3.—Case 4, N., 7-11-47. Before antimalarial treatment.

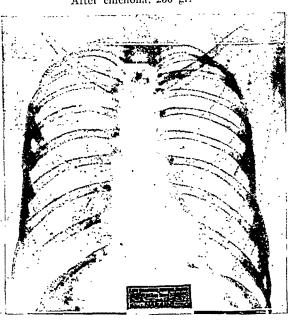


Fig. 4.—Case 4, N., 13-11-47. After cinchona, 144 gr.

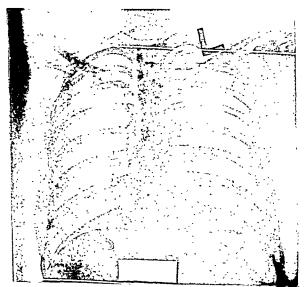


Fig. 5.—Case 4, N., 27-11-47. After mepacrine, 3 grammes.

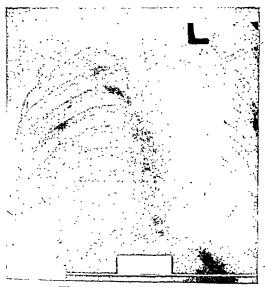


Fig. 6.—Case 5, P., 18-11-47. Before antimalarial treatment.

PLATE VI PRESUMPTIVE MALARIAL PNEUMONIA: ROBERT HEILIG. (O. A.) PAGE 116.



Fig. 7.—Case 5, P., 28-11-47.
After cinchona, 78 gr. and mepacrine, 2.8 grammes

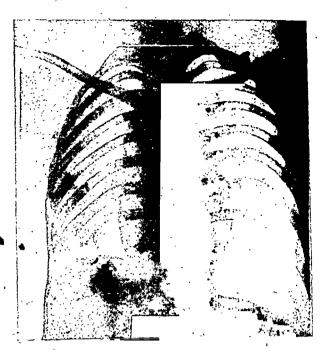


Fig. 8.—Case 5, P., 4-1-48. Follow-up.

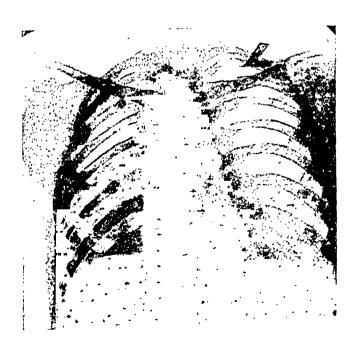


Fig. 9.—Case 5, 27-2-48. Follow-up.

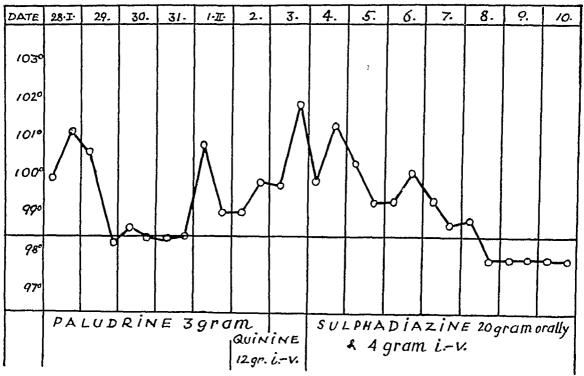


Fig. 6.—Case 6. Temperature chart.

Discussion

In a previous paper (Heilig, 1945), it was pointed out that every case of delirious pneumonia, not responding promptly to sulpha drugs, is suspect of being complicated with malaria, provided that the patient is not addicted to alcohol, bhang (Canabis indica) or opium, and it was emphasized that in such cases antimalarial treatment should be combined with sulpha drugs. Simultaneous administration of sulphadiazine and mepacrine (quinacrine) was shown to be free from any untoward by-effects, an experience reported also by Applebaum and Shrager (1944), and by Bercovitz (1945).

In the present investigation we tried to determine the relation between malaria and pneumonia in such cases. The question is whether we have to deal merely with cases of pneumonia cum malaria, where both the infections are running their course independently of each other, or whether in some of them the malarial factor is integrated into the pathology of the pneumonic process so closely that it determines its course and that one is justified in talking of malarial pneumonia. In the former case, it should not be difficult to treat the pneumonia successfully with sulpha drugs or penicillin while malarial attacks would continue unchecked, whereas a truly malarial pneumonia according to our definition could be cured by nothing but antimalarial treatment. To come to a definite conclusion, we selected for this report only such cases who had received a full course of sulpha drugs or penicillin and proved resistant to this standard treatment, whereas they responded promptly to antimalarial therapy.

Diagnosis.—The descriptions of pulmonary manifestations of malaria in the textbooks of tropical medicine are somewhat vague and cover mainly bronchitis and broncho-pneumonic signs. Manson-Bahr (1945) describes 'congestion of the pulmonary vessels, bronchitic symptoms or even ædema of the lungs'. Strong in Stitt's standard work (1944) mentions among other recognized types, the so-called pneumonic type in which, with the symptoms of a bronchopneumonia, we find an element of periodicity and a response to quinine'. Rogers and Megaw (1944) dismiss the problem with the sentence 'broncho-pneumonia is an occasional symptom' and equally non-committal is Napier's (1946) statement that 'other types . . . are the cardiac and the broncho-pneumonic. They are selfexplanatory'. Christian (1947) declares that co-existence of lobar pneumonia and malaria could be nothing but co-incidence. Applebaum and Shrager (1944), whose observations resemble more closely our own, have tabulated 113 cases (93.4 per cent) of lobular 'pneumonitis with malaria' against only 6 cases of lobar type. Of their five cases who are reported in detail, only one case fulfils our criterion of a malarial pneumonia, being sulpha drug-resistant and responding clearly to antimalarial therapy.

The cases which we presume to be malarial pneumonias are of an entirely different kind. They represent massive consolidations, clinically and radiologically indistinguishable from ordinary lobar pneumonias. The patients are neither more nor less toxemic or prostrate than other cases of pneumonia. Leucocyte count,

differential picture and erythrocyte sedimentation rate do not differ from those seen in pneumococcal pneumonia. The fever chart. however, might give a clue to the right diagnosis. In cases 1, 3, 4 and 5 the fever was of an intermittent, almost remittent type, suggestive of a quotidian malaria and, certainly, in no way resembling the continuous fever of a lobar pneumonia in the pre-sulpha drug era. Rigors and profuse perspiration were not noticed even in those patients who showed remittent fever. The spleen, however, was enlarged and the malaria flocculation test positive in all of them. The latter is practically specific for malaria, if cases of cirrhosis of the liver, nephrotic type of subacute nephritis and kala-azar are excluded.

The fact that malarial parasites have been found only in two of the reported five cases requires additional caution in making a diagnosis malarial pneumonia, But among the numerous cases of malaria who fill our outdoor department and the wards throughout the year, parasites are found but rarely because most of these patients have been pre-treated with mepacrine or paludrine in doses just sufficient to suppress the fever for a short while and to make the detection of plasmodia difficult, but quite inadequate to prevent frequent relapses and malarial sequelæ for which they seek

Under these circumstances we have to base our diagnosis mainly on the proved resistance to sulpha drugs or penicillin, and the therapeutic effect of antimalarial treatment, which might leave some room for doubt about the stringency of the diagnosis in those cases where parasites could not be detected.

Against the conclusiveness of the therapeutic test one could argue that quinine was used also in the treatment of pneumococcal pneumonias. This indication, however, was based on the antipyretic effect of quinine which is poor and on its alleged antibacterial properties which are unreliable even in high concentrations (Goodman and Gilman, 1944); therefore, the use of quinine in the treatment of pneumococcal pneumonias was abandoned some 30 years ago and optochin (ethylhydrocupreine) was tried which is chemically related to and yet quite distinct from quinine; in spite of the specific antipneumococcal effect of optochin its clinical application was not practicable because of its high toxicity.

The practical importance of the therapeutic test for the differential diagnosis between pneumonia associated with malaria on the one hand and malarial pneumonia on the other, is demonstrated by the history of case 6 which shows how a pneumonia accompanied by M.T. rings in the patient's blood spread to the other lung during and in spite of antimalarial treatment whereas sulphadiazine brought about speedy relief.

The seasonal incidence of presumptive malarial pneumonia is determined by the pneumonia season (November to mid-March) and not by

the maximum incidence of malaria (September to November and March-April); almost all of our cases started in November-December. This fact gives a clue to the atiological relation between malaria and pneumonia in these cases.

The conception which fits best our observations is that an ordinary lobar pneumonia, probably caused by pneumococci, is rendered sulpha drug- and penicillin-resistant by a coexistent malarial infection. The malarial parasite or the humoral changes produced by it prevent the normal response to the standard treatment; resolution and defervescence are delayed indefinitely unless and until the malarial factor is cradicated.

It is thinkable that in malarial pneumonia the sulpha drugs produce their usual effect on pneumococci, indicated by an initial drop of temperature in cases 1, 2, 4, and yet resolution does not take place because the simultaneous malarial infection prevents formation or effect of the proteolytic enzymes which should liquefy the alveolar exudate. Malarial parasites or pigment might also block the activity of phagocytes or choke the capillaries through which normally macrophages are removing the debris.

Prognosis.—As long as these cases are treated on the lines of non-malarial pneumonias, i.e. with sulpha drugs and penicillin, they cause anxiety; as soon as antimalarial treatment is instituted, the clinical picture changes immediately and

convalescence progresses well.

Treatment.—Usually we start with sulphadiazine, sometimes followed by penicillin, to rule out cases responding to the routine treatment. Resistance to this medication is one of the main indications to try antimalarial therapy. For the sake of expediency, we usually gave first cinchona febrifuge, which in properly selected cases cuts the fever short overnight, and followed up with mepacrine, as cinchona alone rarely had a lasting effect.

In future, we intend to use either mepacrine only, as we did already in some cases, or paludrine which in our experience has to be given in doses of 0.6 gm. (6 tablets) a day to achieve a fairly prompt effect. This will exclude the possibility of an unspecific cinchona effect.

If a patient is delirious while sulpha drugs are given, niacin (nicotinic acid), 100 mg. twice a day intravenously, usually proves very beneficial; but if the mental condition does not clear up promptly, we feel that this is an additional indication to switch over to antimalarial drugs which in malarial pneumonia never failed to restore promptly full consciousness.

Summary. Five cases of presumptive malarial pneumonia involving one half to three lobes are reported in detail with their fever charts and, three of them, with serial radiograms. While physical and radiological findings were those of a pneumococcus pneumonia, in four of these cases, the fever was remittent, swinging between 98°F. or 99°F. and 101°F. or 102°F. The leucocyte count on admission was 5,500, 8,500, 13,000, 14,800 and 20,000 respectively; the differential picture showed a moderate monocytosis. The sedimentation rate of erythrocytes was considerably increased. B.T. rings were found in two cases; the malaria flocculation test was or soon became positive in all of them. Slight or moderate enlargement of the spleen was present without exception.

As a contrast, a case of pneumonia merely

associated with malaria is described.

The most important feature, common to all of the cases of presumptive malarial pneumonia, was that neither sulpha drugs nor, in two of them, penicillin had any effect either on the general condition or the pneumonic consolidation or on the temperature, whereas antimalarial therapy promptly brought about defervescence, and surprisingly quick resolution improvement. It is concluded that these cases represent a little known syndrome of combined pneumococcus and malarial infection, where the elimination of the former does not lead to any clinical improvement because the presence of plasmodia maintains fever and prevents resolution. The importance of recognizing the malarial factor is emphasized, as timely institution of antimalarial therapy proves life saving.

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KERATOSIS BLENNORRHAGICA

A CASE REPORT WITH A REVIEW OF THE LITERATURE

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Introduction.—This is a comparatively rare condition and we have been able to find only one

case which has been reported as occurring in an Indian patient. Rajan and Rangiah (1941) described a case with the typical triad of urethritis, polyarthritis and skin lesions. Sutton and Sutton in their classical book on skin diseases have excellent illustrations of the skin condition and quote Roth (1905) who records cases without arthritis. They also quote a case occurring in a young negress who had no arthritis. The following case is reported because of the severity and extent of the lesion.

History of findings.—A poorly-nourished female child, aged seven years, was carried by her mother into the outpatient department of the Christian Medical College Hospital on 13th June, 1947. The mother stated that the present illness started about one year previously with fever lasting for eight days. She then noticed 'blisters' which covered both the upper and lower lips. These subsided gradually during the next seven days, leaving hard crusts over the blistered areas. A week after the onset of the illness the mother noticed small blisters all over the body, which were most prominent on the buttocks, perineum, knees, elbows and palms. The lesions were treated with indigenous medicine in her village. The blisters on the body subsided without crusting but those on the buttocks, perineum, knees, elbows and palms remained, and these underwent crusting as had occurred already on the lips. She also noticed that 'blisters' had developed under the free margin of the nails of the hands and feet and following subsidence of the blisters the nails were found to be horny and brittle. Two weeks after the onset of the lesions on the body surface generally, 'fissured sores were seen on the undersurface of the heels'; and a few days later crusts appeared in these positions also. Since the development of the lesions the child has been unable to walk. The lesions extended from the heels to the soles of the feet shortly after they had appeared on the heels. There was no history obtainable of urethritis or joint pains. She had had bilateral discharge from the ears for the previous two years.

On examination.—The lips were hard and cracked, with fissures between thickened, scaly epithelium which formed narrow ridges (figure 1, plate VII). The lesion was confined to the external surface of the mucous membrane of both lips. The gums were covered with sordes. In the centre of the forehead there was a knobbly horny mass about one cm. in diameter. The lesions on the palm and dorsum of the hands (figures 2 and 3, plate VII), elbows, knees and the soles of the feet (figure 4, plate VII) resembled one another. 'They were knobbly horny masses with thick brown incrustations and relief map-like projections' (Rajan and Rangiah, 1941). These lesions were relatively clean and showed little evidence of secondary infection. The heels and soles of the feet, the perineum, buttocks and inner aspects of the thigh were covered with hard cauliflower-like masses of horny material,

which were deeply fissured. These fissures were filled with foul-smelling discharge (figure 5, plate VII).

Clinical pathology

Urine: Slight trace albumen, urates present. Blood: 7.5 g. hæmoglobin per 100 c.c. blood. Both mother and child negative. Cold agglutinins: negative. Smear from vulva negative for gonococci. Scraping of skin for

tinea-negative.

Histological report.—31st July, 1947. Pieces of tissue were taken for histological examination from the heel and the buttocks. They were fixed in 10 per cent formol saline and the sections stained with hæmatoxylin and eosin. The report on these specimens was as follows:---The papillæ of the epidermis are markedly swollen and the downgrowths from the epithelium project a long way into the dermis (figure 6, plate VII). At one point there is disintegration of the roof of the epithelium and here the epithelium is considerably thinned and is covered at this point by a mass of poly-morphonuclear leucocytes. The superficial layers of the epithelium are undergoing desquamation and crust formation (figure 7, plate VII). The deeper layers of the epidermis at this point are heavily infiltrated with polymorphonuclear leucocytes. In the dermis there were numerous dilated capillaries from which polymorphonuclear leucocytes are passing out by diapedesis into the surrounding tissue. The endothelium of the capillaries is considerably The tissue between the capillaries thickened. is densely infiltrated with inflammatory cells which are mainly small round cells and plasma cells, in one area there are numerous pigmented macrophages which appear to have removed the pigment from the deeper layers of the epidermis (figure 6, plate VII). In between these areas of inflammatory infiltration there are bands of proliferating fibroblasts. The section shows marked parakeratosis and acanthosis and the appearance is consistent with the diagnosis of keratosis blennorrhagica.

Treatment

1. General.—The patient was admitted to the venereal ward on 13th June, 1947, and given sulphadiazine 0.5 gm. four-hourly day and night for 4 days followed by 0.25 g. four-hourly day and night for 3 days. At the same time T.A.B. vaccine was given intravenously in doses of 25 million, 50 million, 75 million, 100 million, 150 million, 200 million, on alternate days.

30th June, 1947. Penicillin 20,000 units three-

hourly day and night was given until 1,000,000 units had been given. During this period there was improvement as shown by a diminution of the crusting with falling off of the horny scales and a reduction in the size of the lesions in all areas but most marked on the feet and hands (figures 8, 9 and 10, plates VII and VIII).

The secondary infection except on the buttocks (figure 11, plate VIII) and around the vulva completely cleared up.

21st July, 1947. Penicillin was given again

in the same dosage.
31st July, 1947. T.A.B. vaccine was given in the same dosage, but starting with 50 million. Ferri et ammon. cit. gr. xv t.d.s. was given for 7 days but discontinued because of diarrhea.

2. Diet.—Milk, jagari, kanji, fruit, and glucose in addition to rice and vegetable diet.

3. Local.—Sitz baths twice daily since admission on 17th June, 1947. Sulphur emulsion 10 per cent daily on the body for one week. Mouth was cleaned with borax and glycerine and lanoline was applied to the lips.

26th June, 1947. Ears on examination showed central perforations in both ear drums and these were treated with hydrogen peroxide and mer-

curochrome drops.

7th July, 1947. Nails were cut and some horny growths removed. The crusts fell off

after bathing in hot water.

10th July, 1947. Deep x-ray therapy given daily for 5 days, then every second day, then gradually spaced out for seven more treatments until 6th August, 1947. The dosage was as follows: 150 K.V.P. 15 M.A. 25 cu. 10 al. 100 R. 10 \times 10.7 size I and III areas. This greatly improved the hands and feet but the perineum and buttocks did not improve to the same extent.

12th July, 1947. Starch poultice for 24 hours followed by the application of Lassar's paste to left hand, right knee and foot were applied. No noticeable improvement was seen.

21st July, 1947. Penicillin cream was applied

to lips twice daily.

28th July, 1947. Penicillin cream was applied to the left hand which was bandaged.

August, 1947. Penicillin cream was

applied to the vulva, anus and thighs.

Rangiah Discussion.—Rajan and refer to the rareness of this condition when they state that up to 1940 only 93 cases had been reported in the literature. It is of interest that most cases reported were in men and only one case was reported in a child aged 4 years. They consider that urethritis and polyarthritis nearly always precede the cutaneous eruption. In this case urethritis may have passed unnoticed, or been concealed by the secondary infection seen around the vulva, perineum and buttocks There was no history admission. polyarthritis, but it is reasonable to point out that arthritis is an uncommon complication of gonorrhæa in children. Rajan and Rangiah (1941) state that fever as in this case preceded the eruptions which appear most commonly on the palms, trunk, legs and mucous membranes of mouth. The classical picture of vesicles leading to a crust formation (figure 7, plate VII) is well seen in this case and the covering of the greater part of the sole with horny masses is well shown in the photographs (figure 4,

plate VII). The subungual keratoma is a characteristic finding which is seen in this case (figure 2, plate VII). Satulsky (1945) comments on the infrequency with which gram-negative diplococci can be found in the skin lesions, and suggests an allergic basis for the development of the lesions. Much discussion has centred around the relation between this disease and psoriasis, but Keim (1924) has pointed out a distinct histological picture. Satulsky publishes photographs of hands and feet which show close resemblance to the skin lesions in the case reported. He also refers to the satisfactory result of penicillin, which we have also noticed. Herold and Smith (1941) have illustrations which closely correspond to those seen on the feet of this case and their photomicroscopic illustrations show the same destruction of the superficial layers of the epithelium (figure 7, plate VII).

Downing (1934) shows in his illustrations marked changes around the nails, but less marked effects on the soles and feet. This is probably accounted for by the fact that the case which he reports is a fairly acute one.

Sutton and Sutton (1939) give illustrations which resemble very closely those seen in our case. They consider that gonorrheal infection is the cause of the condition but the search for the organism has proved fruitless in the experience of many observers. They consider that arthritis is absent in 10 per cent of the cases. They agree with Keim (1924) that the hyperkeratotic exanthem is peculiar to gonococcal infections and is entirely distinct from arthropathic psoriasis.

Summary

- 1. A case is reported of keratosis blennorrhagica occurring in a female child of seven years.
- 2. Reference to the literature shows that the skin lesions are very typical of this condition.
- 3. The absence of the other two classical symptoms of the triad-urethritis and arthritisis discussed, and an explanation offered.
- The treatment is outlined and the response is shown by the photographs.

We wish to thank Dr. Ammini Philips and Dr. Krishna Iyer for their help with clinical notes and treatment; Dr. R. G. Cochrane for his help in interpreting the skin biopsies; Mr. James Laurence for the photomicrographs and Dr. R. V. Rajan for advice and

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[The reader may refer to the Special Venereal Disease Number, I.M.G., 82, No. 10, October 1947, for this disease.—Editor, I.M.G.]

THE INCIDENCE AND CAUSATION OF GLYCOSURIA IN PREGNANCY

Part II

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In a previous publication (Batliwalla, 1947) the incidence of glycosuria in pregnancy was reported. In this paper the following two subjects are dealt with: (1) blood sugar, blood vitamin C and blood calcium in pregnant women, and (2) sugar tolerance curves and their significance in pregnant women.

Some pregnancy glycosuria cases were taken up for glucose tolerance test. These patients prior to and during their examination were kept on a standard hospital diet. Blood sugar was estimated in the starving sample and in the 1/2, 1, 12 and 2-hour samples, after the administration of 50 gm. of glucose, by Hagedorn and Jensen ferricyanide titration method (Peters and van Slyke, 1932). The method of Farmer and Abt (1936) was employed for estimation of vitamin C in blood. The blood calcium was estimated by the method of Kramer and Tisdall and non-protein nitrogen estimated by Cole's (1933) method.

The results of the mean glucose tolerance tests of pregnant cases together with the record of urinary sugar are shown in table I, and illustrated in graph I. Comparable figures obtained in pregnant non-glycosuria cases and normals (nurses) are recorded in table II. A comparative study of the data regarding the diet of these cases suggested that probably vitamin C and blood calcium played an important rôle in influencing the course of pregnancy glycosuria. Some cases from the antenatal ward of Nowrojee Wadia Hospital were therefore further examined for glucose tolerance as well as calcium, sugar, non-protein nitrogen and vitamin C in the blood. Means of these figures are snown in table III. The fact that glycosuria in pregnancy is associated with the low vitamin C and calcium content of blood is illustrated in graphs II and III

Discussion

In my investigation of 540 cases 4 only were cases of true diabetes mellitus and the remaining 536 were cases of renal glycosuria as was manifest from the data furnished by the glucose tolerance tests. The 4 cases of diabetes mellitus were in the multipara.

A large majority of pregnant women of the poorer class in this part of the country take very little milk or none at all. Even those women who do take milk, the quantity they consume on an average is about 1 to 2 oz. per day, which is about one-twentieth of the quantity of milk recommended per day by Dieckmann and Swanson (1939). The staple calcium containing article of their diet is cereals. Almost every native of Western India takes rice either alone or with jowar, bajra or wheat. The other calcium rich item in the food of the people of this part of the country is dhal arhar (tur dhal or red gram, Cajanus indicus) and sometimes lentil or massur dhal (Lens esculenta). Their calcium content as given in the Health Bulletin No. 23 (Aykroyd, 1941) and phosphorus and phytin phosphorus content as given by Sundararajan (1938) are as follows:

		Calcium, per cent	Phosphorus, per cent	Phytin, per cent	
Tur dhal	••	0.14	0.26	75.97	
Massur dhal		0.13	0.25	75.98	

Besides, they are rich in proteins. The protein contents of tur dhal and massur dhal are 22.3 per cent and 25.1 per cent respectively.

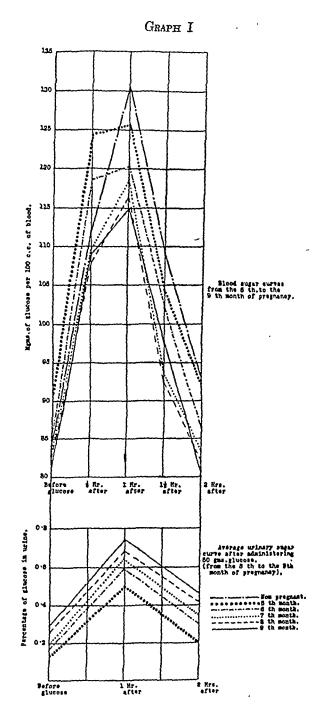
Those who can afford to take these pulses, use them with rice in the proportion of 1:4, but being costly the poorer classes take them rather sparingly in their diet.

The calcium and phosphorus content of bajra, jowar, rice and wheat as set out in the *Health Bulletin* No. 23 (Aykroyd, 1941) and the phytin content of whole wheat and milled or polished rice as given by McCance and Widdowson (1935) and phytin content of bajra and jowar as given by Sundararajan (1938) are as follows:—

	Calcium, per cent	Phosphorus, per cent	Phytin, per cent
Bajra or cambu (Pennisetum typoideum).	0.05	0.35	74.92
Rice (raw milled) (Oryza sativa). Jowar or cholam	0.01	0.11	41.5
(Sorghum vul- gare).	0.03	0.28	88.49
Wheat (Triticum vulgare).	0.05	0.32	46.4

McCollum and his co-workers (1939) referring to the work of Shohl and Wolbach (1936) point out that in rats, there is a very poor mineralization of bones if the Ca: P ratio of their diet is 1:4 and it is still worse if the ratio is 1:8 even though the amounts of calcium given are adequate. According to them, the ideal ratio for an adult is 1:1 and for infants it is from 5:1 to 2:1.

The chief calcium containing article of diet of almost all the cases that were examined was rice or sometimes rice with jowar, bajra and wheat. From the calcium and phosphorus contents of these cereals, it will be seen that the Ca: P ratio of rice is 1:11, of jowar 1:9, of bajra 1:7 and of wheat 1:6. McCance and Widdowson (1942) state that 'in whole wheat flour phytic acid is the agent that is primarily responsible for poor absorption of calcium'.



Similarly, the phytin content of other cereals is also responsible for poor calcium absorption. The phytin content of rice and wheat as shown above is almost the same and as the calcium content of wheat is five times greater than that of rice, patients whose chief diet is wheat will be able to absorb much more calcium than those whose chief diet is rice.

These remarks apply also to bajra and jowar, though they contain a slightly greater percentage of phytin than rice or wheat. A mixture of rice with wheat or jowar or bajra can thus better supply the calcium requirements of the body than when rice only is taken.

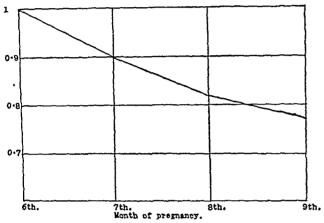
Apart from diet, the other factor that regulates the level of serum calcium is the demand of the

fœtus.

Winkler and Fritsche (1939) state that the concentration of calcium in the fœtal tissues runs parallel with the advancement of pregnancy and is approximately proportional to the absolute increase in the weight of the fœtus.

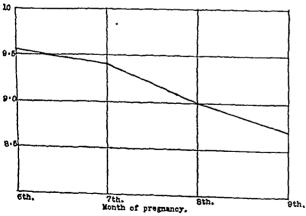
GRAPH II

Vit C content in different months of pregnancy in glycosuria cases.



GRAPH III

Serum Calcium content in different months of pregnancy in glycosuria cases.



Swanson and Iob (1939) illustrate graphically the calcium content of the fœtus in the different months of pregnancy. The increase of the calcium content from the 3rd to about the 7th month is from about 1 gm. to about 7 gm. only. On the other hand, from the 7th month to the end of pregnancy, the increase is very pronounced, being from about 7 gm. to about 24 gm. In the same article, the said authors point out that vitamin D produced by sunlight plays an important part in mineral retention. In the

tropics the sunlight being abundant, plenty of vitamin D is produced. Hence this factor can be taken as a constant for all cases.

All the aforesaid references go to prove (a) that there is an increased demand of the fœtus for calcium from month to month as pregnancy advances, (b) and that the demand of the fœtus for calcium in the last month or two of pregnancy is fairly high. In fact, the fœtus takes up more calcium during this period than the mother is storing (Cowell, 1935).

Trumper and Cantarow (1932) state as follows:—

'Hamburger and Bronksman found that the renal threshold for glucose could be raised or lowered by increasing or decreasing the ratio between calcium and sodium and potassium in the perfusing fluid. Cammidge goes on as far as to state that renal glycosuria is always associated with an absolute and not merely a relative reduction in the proportion of calcium in the blood plasma'.

As the diet of the pregnant woman remains practically unchanged (i.e. calcium supply remains more or less constant) and the fœtal demand for calcium goes on increasing, the serum calcium (vide graph III) falls with the advance of pregnancy and this fall leads to a lowering of the renal threshold for glucose as pregnancy advances.

A relationship has been found to exist between vitamin C content of blood and glycosuria. The vitamin C content of milk is negligible being 2 mg. per cent only (Aykroyd, 1941). The two articles of diet that are very rich in vitamin C are the leafy vegetables and citrus fruits. 'According to Sherman (1941) 'the conservation of the vitamin C values of food depend upon (1) protecting this vitamin from oxidation ..., (2) the avoidance of copper and other catalysts (which rapidly destroy it), and (3) the maintenance of low temperature and acid reactions'. Unfortunately, the method of cooking vegetables prevalent in this part of the country is such as to almost completely destroy the vitamin C content of vegetables. The vegetables are boiled mostly in copper vessels under conditions that are anything but anærobic. They are fried in ghee or vegetable oils, and before they are finally served, they are once again heated so that they may be served hot. Thus leafy vegetables as a source of vitamin C are of little avail. No wonder even in the richer class of people as Fernandez (1939) points out 'a state of subnutrition of vitamin C is observed in this part of the country. Only about 20 per cent of the cases were found to be saturated '.

The other vitamin C rich food are the citrus fruits. These fruits are undoubtedly the richest and almost the chief available source of vitamin C. The citrus fruits eaten in this part of the country are oranges (Citrus orantium) and lemons (Citrus medica yar. limonium), whose

vitamin C content on an average per piece is about 50 mg.

Eddy and Dalidorf (1939) observed that 'guinea-pigs on vitamin C low diet show lowered dextrose tolerance'. Pfleger and Scholl (1937) record that when 'patients were given a standard

(1939) observe that 'the rise in the blood sugar of a patient taking 100 gm. of glucose by mouth was greater after high dosage with vitamin C than after no vitamin therapy'. Roller (1936) observes that 'glycosuria can be reduced if a diet, rich in vitamin C, is given'.

Table I

Mean values of glucose tolerance test of cases showing sugar in urine

		i							
Number of cases studied	Month of pregnancy		Brood sug	AR IN MG.	PERCENTAGE OF GLUCOSE IN URINE				
		Before glucose	½ hour after	1 hour after	1½ hours after	2 hours after	Before glucose	1 hour after	2 hours
8 12 13 17 22	5 6 7 8 9	91.13 85.25 82.80 82.60 81.20	124.38 118.5 108.5 107.9 109.8	125.63 120.42 117.4 116.4 115.9	104.25 102.25 96.0 97.94 98.3	92.00 86.83 82.9 82.3 80.1	0.13 0.17 0.20 0.26 0.29	0.49 0.59 0.64 0.68 0.75	0.20 0.30 0.35 0.41 0.46

Table II

Detailed record of pregnant cases showing no sugar in urine

				Gruco	Blood	Serum	Blood			
Mon	Month of pregnancy		Blo	od sugar e	vitamin	calcium	NPN			
		Before glucose	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		2 hours after	Mg. per 100 c.c.				
6th 7th 8th 9th Normals	(nurses) m	 	95.0 100.0 84.8 90.5 84.5	106.0 110.0 122.4 109.5 117.1	110.0 113.0 117.6 116.25 130.0	103.0 106.0 101.8 96.25 109.2	92.0 95.0 84.2 85.0 93.1	0.85 1.00 1.15 1.29 1.78	10.0 9.9 9.42 9.47 9.84	15.5 13.6 18.2 17.43 17.6

Table III

Mean values of glucose tolerance test together with calcium, vitamin C and non-protein nitrogen in blood of pregnant glycosuria cases

		Glucose	TOLERAN	CE TEST			URINE	REPORT	Blood vit. C	Serum calcium	Blood NPN	
$\begin{array}{c} \textbf{Month} \\ \textbf{of} \end{array}$	Blood	sugar co	ntent in	mg. per	100 c.c.	Percen	tage of	glucose i	n urine			
pregnancy	Before glucose	hour after	1 hour after	1½ hours after	2 hours after	Before glucose	1 hour after	2 hours after	Urine, per cent	Mg. per 100 c.c.		
6th 7th 8th 9th	84.7 72.7 76.3 78.7	118.8 104.7 104.6 108.6	22.6 115.5 112.5 118.7	106.5 94.3 90.5 97.5	83.4 74.3 75.9 76.2	0.18 0.33 0.18 0.28 Gener	0.66 0.66 0.59 0.75 ral mean	0.35 0.38 0.35 0.46 of above	1.07 1.21 0.86 1.22 cases	1.01 0.90 0.82 0.77 0.83	9.56 9.4 9.0 8.7 9.0	16.64 17.5 16.5 18.32 17.5

diet and insufficient insulin, they passed 3.25 gm. of glucose per day. When the condition had become stable the patients were saturated with ascorbic acid and by the time this had been done the patients were sugar-free or urinary sugar had markedly decreased '. Diehl and Kirchmann

The above observations go to show that there is greater tolerance for glucose when a diet rich in vitamin C is taken. Cases taking per day at least one sweet lime or one orange or any fruit containing inter alia at least 50 mg. of vitamin C have been classified as fruit-eating cases. The

incidence of glycosuria in these cases is very low as compared to cases not taking fruits because in these fruit-eating cases the tolerance for glucose is raised. Besides, these fruits contain a fair amount of calcium. According to Dieckmann and Swanson (1939) the calcium content of 12 oranges is equal to one quart of milk which according to them contains sufficient daily calcium requirement of a pregnant woman. Calcium, as I have already shown, raised the tolerance for glucose, hence cases who take even one orange or sweet lime a day get one-twelfth of their daily calcium requirement from it. The importance of taking fruits during pregnancy cannot be overestimated, because it leads to increased tolerance for carbohydrates, prevents glycosuria and thus conserves the nutrition of the pregnant woman. The dietetic value of fruits in pregnancy, which our grandmothers knew long before our times, is thus scientifically established. Moreover, vitamin C not only raises the renal threshold for glucose, but, as Pfleger and Scholl (1937) point out 'saturation with vitamin C produces an increase in the capacity of liver to store glucose'. Stöger (1940) finds that administration of 300 to 400 mg. of vitamin C for five days every month in cases of renal glycosuria produces a considerable and a permanent reduction of glycosuria. Thus the importance of vitamin C rich diet in pregnancy is established.

Neuweiler (1935) finds that the vitamin C consumption is greater in pregnant than in non-pregnant women. Smith (1938) says that Widenbouer has found that the daily requirement of vitamin C rose from 28 mg. to 71 mg. at the third month and remained almost constant showing a slight drop to 68 mg. at the end of pregnancy. Elmby and Becker-Christensen (1938) find that the titre of serum ascorbic acid falls during pregnancy. Snelling and Jackson (1939) find 'a slight fall of vitamin C towards the end of pregnancy. Fœtus acts as a parasite and has higher levels than the ante-partum maternal blood'.

On the amount of vitamin C in blood depends the renal threshold for glucose. It stands to reason that the fœtus (parasite) as it goes on growing will take up more and more vitamin C at the expense of the mother, thus depleting her store (vide graph II) and leading to increased susceptibility to glycosuria as pregnancy advances. The growth and development of the fœtus are most pronounced in the last two months of pregnancy so that its parasitic action in consuming vitamin C becomes more pronounced at this stage. The result is that the incidence of glycosuria becomes more marked during this period in cases taking vitamin C poor food than in those taking vitamin C rich food.

From table I and graph I it could be seen that the blood sugar level (fasting as well as the level after administration of 50 gm. of glucose by mouth) showed a gradual fall in the renal glycosuria cases as pregnancy advanced; on the other hand, the urinary sugar level (fasting as well as after administration of 50 gm. of glucose by mouth) showed a gradual rise as pregnancy advanced

It is further clear from the data given in the table that the blood sugar level in non-glycosuria cases is higher than in glycosuria cases, because there is no renal leak in the former class of cases. However, the rise in the blood sugar level in non-glycosuria pregnant cases after administration of 50 gm, of glucose by mouth is far less than in non-pregnant cases (nurses) because in the former probably the growing fœtus and the enlarged uterus with its appendages make a great demand for glucose.

It is well known that the majority of endocrines show signs of increased activity during pregnancy. There is increased vascularization of the para-thyroid and hypertrophy and hyperplasia of its chromophile cells. An enlargement of thyroid and a decrease in its iodine content are concomitants of pregnancy in 75 per cent of cases. A proliferation and hyperplasia of the eosinophil cells of the anterior pituitary are responsible for its enlargement and for this reason they are known as pregnancy cells. The adrenal cortex is also hypertrophied and the cells of zona fasciculata and reticularis show vacuoles, increased pigment and lipoid.

Vitamins and hormones, such as thyroid and pituitary hormones, insulin, etc., are transferred from the maternal to the feetal blood before endocrines begin to function in the embryo (Schlossmann, 1923). Glucose is the chief source of energy during the early embryonic development. The decidual cells of the placenta store large quantities of glycogen during the first three-quarters of pregnancy, only late in pregnancy does the fœtal liver develop a significant glycogenic function. tendency to maternal hyperglycæmia as a result of hyperactivity of most of these endocrines is checked partly by the storage of glucose in the placenta and partly by the transfer of glucose to the fætal circulation and excessive utilization of sugar by the fœtus. The metabolic rate of fœtus has been shown to be definitely higher than that of the mother.

The level of vitamin C and calcium in blood decreases in glycosuria cases as pregnancy advances (graphs II and III). It seemed probable therefore that the levels of the blood vitamin C and serum calcium are the two chief factors that are primarily responsible for glycosuria in pregnancy. However, one cannot fix nor find a definite level for serum calcium or vitamin C below which glycosuria occurs; and if there is any such level it is likely to vary with the individual concerned since deficiency of these substances is effective in producing glycosuria only when associated with the presence of some unknown toxic factors in the blood. According to Beaumont and Dodds (1934) in normal blood 20 per cent of the non-protein

nitrogenous bodies are not identified and constitute the 'residual nitrogen'. These bodies may be toxic. It is probable that some such hitherto unidentified non-protein nitrogenous bodies appear in the blood in pregnancy and these substances lower the renal threshold for glucose when associated with low blood calcium and low vitamin C content in blood. In many respects the fœtus resembles a neoplastic growth. It not only removes food material, inorganic constituents and oxygen from the maternal blood and loads it with products of metabolism, but by digestive action of trophoblasts causes formation of toxic products of protein breakdown which may exert an unfavourable influence on the health of the mother.

The ætiology of gout may provide a parallelism. 'Normal blood contains, on the average, about 3 mg. of uric acid per 100 c.c. In gout the concentration of uric acid in blood is raised and may be as high as 10 mg. per 100 c.c.' (Best and Taylor, 1939) and there is a deposition of sodium mono-urate crystals in cartilage, tendons and joints. The reason why such specific deposition occurs in this disease but not in others (e.g. leukæmia, etc., in which blood uric acid reaches even higher levels) still remains unknown. Some local factor is apparently necessary for deposition to occur and according to Wiggers (1939) some abnormal physical or metabolic states cartilage, tendons, etc., induced by toxic or allergic influences encourage the deposition of urates. It is possible that glycosuria of pregnancy is similarly due to some local factor induced by toxic influences, which, when associated with low blood calcium and low vitamin C content of blood, depresses the power of the kidney tubules to re-absorb the glucose and so reduces the renal threshold for sugar.

Conclusion

- The starving blood sugar level falls and the starving urinary sugar level rises as pregnancy advances as seen in graph 1.
- After administration of 50 gm. of glucose blood sugar level shows a gradual fall, whereas the urinary sugar level shows a gradual rise as pregnancy advances.
- The mean vitamin C content of blood is the lowest in pregnant glycosuria cases, it is higher in pregnant non-glycosuria cases and is the highest in non-pregnant cases (nurses).
- 4. The blood NPN is almost the same in all these sets of cases.

The investigations so far reported have shown that probably the lowering of vitamin C content of blood and calcium play an important rôle in the causation of glycosuria of pregnancy. Verification of this tentative conclusion requires further expérimental proof. Suitable investigations have been, therefore, undertaken in support of this conclusion and the findings would form a part of future publications.

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ERRATUM

SEROLOGICAL TECHNIQUE (contd.)

By S. D. S. GREVAL

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In the above article published in the I.M.G., 83, Jan. 1948, on p. 35, column 1, para 7—

for 'Muscle protein along with the protein of the blood contained in it from the flesh . . . 'read 'Muscle protein, along with the protein of the blood contained in the muscle,'

A Mirror of Hospital Practice

A PRESUMPTIVE CASE OF BICUSPID AORTIC VALVE

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BICUSPID aortic, valve is a fairly common congenital abnormality occurring alone or in combination with certain 'left-sided lesions' especially coarctation and hypoplasia of aorta, subaortic stenosis and patent ductus arteriosus. It was noted as the primary lesion in 32 cases while it complicated other lesions in 46 amongst the 1,000 cases of congenital heart diseases recorded by Abbott (White, 1945).

The grave clinical import of bicuspid aortic valve lies in the nidus it presents for the invasion of infective organisms. Nine out of Abbott's thirty-two cases (28 per cent) developed subacute bacterial endocarditis. Lewis and Grant (1923) arrived at the remarkable conclusion that among males reaching adult life and possessing congenitally bicuspid aortic valve, 23 per cent at least die of active endocarditis; while cases in which aortic valve is principally affected, 40 per cent presented the bicuspid malformation.

With the introduction of newer methods of study and specialization it is now frequently possible to diagnose the bicuspid aortic valve in life, a possibility which seemed so remote some years ago. Bourne (1946) has recently emphasized that in an young individual who has been previously carefully examined and in whom no evidence of heart disease has been found sudden appearance of aortic regurgitation together with subacute bacterial endocarditis is extremely suggestive of bicuspid aortic valve. It is in fact the only available method of

diagnosis of an aortic valve containing two cuspids instead of three.

Below is recorded a case in whom the diagnosis of bicuspid aortic valve was made during life.

Case report

C. P. S., 16 years, Hindu male, was admitted to Thomason Hospital, Agra, on 26th November, 1946, with the complaints of severe pain in the left hypochondrium, breathlessness and restlessness, duration 4 days; and irregular fever, duration 4 months.

history of Past history.—He gave no rheumatism or syphilis or any illness in the past. He was examined every year by the school doctor and declared fit and healthy. Four months previous to admission he suffered from fever with rigor followed by irregular fever for three weeks. The attending physicians examined him regularly but made no remarks about his The temperature remained normal for a week after which it began to rise and persisted for two weeks. During the latter part of this so-called relapse the same physicians noticed 'murmur' in the heart and warned the patient and his relations about the heart affection. Since then he had been running an irregular fever with short remissions. Four days before admission he had a sudden and severe attack of pain in the left hypochondrium which made him restless.

On examination.—The patient looked ill, restless and pale. Early clubbing of fingers and toes present without cyanosis. Temperature 100°F.; pulse 114 per minute, regular, water hammer in character; blood pressure 120/10. Apex beat in the sixth left space 4 inches from midsternal line. Aortic diastolic murmur slightly harsh in character heard best to the left of the sternum. A few moist râles heard at the base of left lung. Spleen 3 inches enlarged and very tender.

Investigations.—Urine: red blood corpuscles present on admission and on repeated examinations. Blood: total red cells 3,280,000; hæmoglobin 6.7 g.; total white cells 4,860, neutrophils 68 per cent, lymphocytes 30 per cent, monocytes 2 per cent; sedimentation rate 63 mm. in an hour; blood culture negative on two occasions; Wassermann negative; blood urea 53 g.; van Slyke's urea clearance 55 of the average normal. Fluoroscopy confirmed the left ventricular enlargement.

Progress.—He was getting irregular fever throughout his stay in the hospital. He had a recurrence of splenic infarct on 18th December, 1946. Aortic diastolic murmur became very harsh and rough in character. Retinal and conjunctival hæmorrhages appeared two days later. He complained of headache on 22nd December,

1946. The following day he vomited and became stuporose. Unconsciousness deepened. Paralysis of left half of the body followed later by paresis on the right side appeared. Blood appeared in the cerebrospinal fluid drawn by lumbar puncture. He died on 26th December, 1946. Autopsy was refused.

Discussion

This case closely resembles the case reported by Bourne (1946). Multiple emboli in spleen, kidney and mycotic aneurysm causing hæmorrhage in brain and subarachnoid space; petechial hæmorrhages in the conjunctiva and retina; irregular fever with periods of short remissions; changing character of the murmur; splenic enlargement; clubbing of fingers and toes; and anæmia suggest the diagnosis of subacute bacterial endocarditis beyond any doubt. The absence of any abnormal findings in the heart on repeated examinations during health and during the first month of illness has been established.

The diagnosis of bicuspid aortic valve is suggested, in this case, by the young age of the patient, absence of any history of rheumatism and syphilis, absence of any abnormal signs in the heart during health and during the first four weeks of the infection and finally by the sudden appearance of aortic incompetence during the course of the unmistakable attack of subacute bacterial endocarditis. It is unfortunate that a post mortem of such an important and typical case was refused, a difficulty constantly met with in our country.

Summary

Bicuspid aortic valve is a common and clinically important congenital abnormality on account of its frequent association with subacute bacterial endocarditis. The diagnosis of bicuspid aortic valve has been discussed with reference to a case report, where the diagnosis was suggested during life.

My thanks are due to Dr. G. N. Vyas, M.D., M.R.C.F., Superintendent, Thomason Hospital, for permission to publish this case.

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Therapeutic Notes

NOTES ON SOME REMEDIES

XVIII.-DRUGS IN ANÆMIAS, Part II

By R. N. CHAUDHURI, M.B. (Cal.), M.B.C.P. (Edin.), T.D.D. (Wales)

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III. HOG'S STOMACH

This contains a factor which is effective in the treatment of pernicious anæmia, though believed to be quite different from the hæmopoietic principle of liver. Stomach preparations are preferred by some authorities and said to be of especial value in the treatment of cord complications. Dose is 10 gm. Thrice a day, and maintenance dose is 10 gm. or more a day. As heat destroys its action, it must be given in cold water, milk, orange juice, etc. Preparations such as desiccated stomach (B.P.C.), ventriculin, pepsac, etc., can be used.

IV. YEAST

Yeast which is rich in B group of vitamins has been used in anæmia with variable results. On the other hand marmite, an autolysed yeast product, has been effective in certain macrocytic anæmias especially tropical nutritional anæmia and pregnancy anæmia. The nature of the active factor has not yet been determined. The response of pernicious anæmia to marmite is however poor, though it is often given as an adjuvant to liver treatment for the valuable vitamins it contains. Dose of marmite—one to two teaspoonful thrice daily, given with fruit juice, soup or toast.

V. VITAMINS

Vitamin C is one of the essential factors in the normal blood formation. It has been shown that the anæmia of scurvy responds to vitamin C and not to iron. Many clinicians think that in iron deficiency anæmia iron is more effective if a supplement of ascorbic acid (50 mg. thrice daily) is prescribed at the same time. A study of some patients with pernicious anæmia living on a restricted dietary during the last war showed that large doses of vitamin C permitted a response to liver therapy otherwise unattainable. It is therefore wise to make sure that all eases of deficiency anæmias take a diet rich in vitamin C or alternatively receive a daily supplement of ascorbic acid.

The B group of vitamins could not at first be identified with any anti-anemic factor though the anemia of pellagra responds to nicotinic acid and the anemia of beriberi improves with marmite. After many trials over a long period with each of the B complex vitamins, folic acid has recently been found to produce a definite hemopoietic response in certain anemias (vide infra), but the nature of its action has not yet been clarified.

VI. INTERNAL SECRETIONS

Deficiencies of thyroid and pituitary may produce anæmias which may be macrocytic or microcytic. Thyroxin acts either as a specific erythropoietic factor or as a marrow stimulant. It is essential for the cure of anæmia associated with thyroid deficiency. 'Some patients with pernicious anæmia have a mild thyroid deficiency and this deficiency should be considered when the response to liver therapy or iron is not all that is desired' (Whitby and Britton, 1946).

The rôle of the anterior lobe of the pituitary in hæmopoiesis is now recognized. Its deficiency may be accompanied by anæmia, usually macrocytic, but in some cases microcytic and hypochromic, responding to liver or iron. Watkinson et al. (1947) reported two cases in which the anæmia was associated with hypopituitarism and hypogonadism and was resistant until testosterone propionate was added to the treatment. It is possible that gonadal deficiency is sometimes associated with impairment of erythropoiesis.

VII. FOLIC ACID

Folic acid, a component of vitamin B complex, is essential for the growth of Lactobacillus casei; it is thus also known as L. casei factor. Originally obtained by fractionation from liver, it was synthesized in 1945 and this synthetic folic acid was tested by Spies et al. (1945) in the treatment of nutritional macrocytic anæmia. It was given by mouth and an excellent response was obtained; there was a reticulocyte peak from the 5th to 8th day, followed by a sustained rise in red cells and hæmoglobin and improvement of the general condition comparable to the response to liver therapy.

These studies were extended to other anæmias and satisfactory responses were reported in Addisonian pernicious anæmia and the macrocytic anæmia of sprue, pregnancy and pellagra. The treatment initiated a change from the megaloblastic to normoblastic marrow, a change which was not obtained with other members of the vitmain B complex. Further investigations did not bear out all the early favourable reports, and we now know folic acid has its limitations, for instance the results in pernicious anæmia are no better than with liver, and it has no effect on lesions

of the central nervous system which may even make their first appearance while the patient is being maintained on it. More recent reports (Editorial, 1948) mention serious neurological disturbances which disappeared when folic acid was discontinued and liver extract was given. In sprue results have been irregular, some have responded well, others only partially or slowly, requiring additional treatment with liver. Results in coliac disease are also variable. Only those cases of these syndromes that have megaloblastic marrow responded to folic acid. Other forms of anæmia may respond if there is a megaloblastic marrow but not if the marrow is normoblastic. It is in the treatment of nutritional anæmias that folic acid is likely to be most useful, and since such anæmias are common in India, the drug may have a wide field of application. It is of no value in iron deficiency anæmia, aplastic anæmia or leukæmia.

Folic acid is not the liver principle. It is neither the extrinsic factor nor the intrinsic factor of Castle. The manner of its action has yet to be worked out, but it has been suggested that it acts as an enzyme or co-enzyme which sets in motion the system for production of the

liver principle.

Like other vitamins, folic acid has many natural sources and exists in several, probably closely related, forms. The name was originally given to a chemical substance isolated from spinach; it is also found in many other green leaves including grass and in mushrooms, liver and yeast. Vitamins M, B₆, B₁₀, and B₁₁ are known to be folic acid variants. As it is widely distributed in vegetable and animal tissues folic acid deficiency is not likely to arise in persons taking a mixed diet, but such a deficiency has been artificially produced in monkeys and rats, the outstanding hæmatological effects being leucopænia, especially lack of polymorphonuclears. When folic acid was first given to patients with nutritional anæmia, it was with the idea of correcting the leucopænia, but the effects on the anæmia were more striking. The leucopoiesis that occurs is really a part of the general hæmopoietic response and there is no proof yet that folic acid has any effect en agranulocytosis or neutropænia following arsenical or sulphonamide therapy.

Folic acid is a bright orange-yellow crystalline substance supplied under trade name 'Folvite' in 5 mg. tablets and in powder form. It can be given by mouth or parenterally. For oral use, the dose varies from 5 to 20 mg. a day, but generally speaking 20 mg. is an effective daily dose given morning and evening. It is reduced to 10 mg. or less when remission is well established. Good results have been obtained in some eases from an initial dose of 400 mg. followed at weekly or fortnightly intervals by doses of 50 to 100 mg. Folic acid can be given parenterally (into muscle or vein) to obtain a rapid initial response in a critically ill patient with macrocytic

anæmia. The powder is dissolved in water with the aid of disodium phosphate and the solution is autoclaved at 10 lb. for 15 minutes or passed through Seitz filter. Ampoules of 15 mg. per c.c. are now available. The usual dose is 15 mg. a day and the maximum dose is 150 mg.; larger doses may cause histamine like vasomotor disturbances. The maintenance dose has yet to be worked out, but so far it has varied from 20 mg. twice a week to 20 mg. once every third week, while some recommend 5 mg. daily.

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Occasional Notes

FORCED FEEDING IN ACUTE DYSENTERY

By A. T. W. SIMEONS, M.D. (Taj Mahal Hotel, Bombay)

For the purpose of this discussion I will regard an attack of acute dysentery as a clinical entity of severe diarrhea having a sudden onset with visible blood, mucus and usually pus in the stool, always tenesmus, sometimes vomiting and often a rise in temperature. I will here disregard the ætiology of this clinical condition which may be bacterial, protozoal or both.

In order to establish definitely the ætiology of an attack of acute dysentery, elaborate laboratory procedures are necessary. These require longer than the average time needed to arrest the clinical symptoms. They call for the highest bacteriological and protozoological skill. The lapse of time between the evacuation and the microbiological investigation is a factor of great importance.

Realizing all this and being entitled to reasonable satisfaction with their results, general practitioners rarely bother to get a specimen investigated. They hardly ever delay treatment until a laboratory report is forthcoming, though in a strictly clinical sense this is what they might be expected to do.

Before the advent of the sulphonamides majority of the cases was treated in general practice as amoebic with emetine and oral amoebicides. Even to-day the sulphonamides are usually reserved for the second therapeutic assault, though statistics tend to show that bacillary is more common than acute amoebic dysentery. No amount of pathological persuasion will convince the general practitioner that he can materially improve his results by basing his treatment strictly on ætiological considerations.

Most oral amœbicides appear to have an antibacterial action in the colon and it is possible

that the drastic reduction of the intestinal flora achieved by the sulphonamides has an inhibiting effect on the multiplication of amœbæ during an acute attack of dysentery. Both can be given simultaneously.

It must further be admitted that to the clinical eye, unaided by a microscope, one attack of acute dysentery looks sufficiently like any other to permit us to regard them all as a clinical entity, whatever the laboratory may differentiate. In the early stages the clinical variations certainly do not correspond to the great biological differences between bacteria, amœbæ, flagellates and ciliates, the accepted ætiological agents.

The negative attitude of the general practitioner towards the help the laboratory promises in acute dysentery is, therefore, not only understandable, it is even justifiable, however deplorable it may be in other respects.

With these considerations in mind I treated unselected cases of acute dysentery without regard to a laboratory diagnosis by the simple combination of an amedicide with a sulphonamide. I used phthalylsulphathiazole, four tablets of 0.5 gm. initially and then two tablets sixhourly, until 50 tablets had been consumed. At the same time I gave di-iodoquinoline, one tablet of 0.2 gm. four times daily for 15 days, 60 tablets in all. No emetine or any other drug was given.

With this fixed medicinal routine and with strict rest in bed the results were gratifying, but they were not as uniform as might have been expected. The lack of uniformity was not apparently related to severity, duration before treatment, the general condition of the patient, nor, it seemed, to varying ætiologies.

Searching for an explanation I noticed that patients who scrupulously observed dietary restrictions seemed to take longer time to recover than those that did not. I recalled the numerous cases that had in the past lurt my professional pride by radiantly confessing that having been tired of the prescribed diet, they had

a thoroughly good meal and felt ever so much better for it. This must have happened time and again to all of us. It set me thinking along

the following lines:-

The sigmoidoscopic appearance of the colonic mucosa in acute dysentery is one of severe inflammation. The colon is empty, spastic and hypermotile. Mucus, blood and pus are churned, squeezed and squelched by a cramplike peristalsis. The inflamed bowel is in violent mechanical turmoil. It is hard to imagine conditions less favourable for an inflammation to subside or for ulcers to heal.

We might be tempted to put an angry gut at ease with opiates and atropine. Clinical experience with the dysenteries shows that this does bring temporary relief but that the lull is followed by an aggravation, possibly because these drugs induce a form of paralysis which interferes with a normal peristaltic transport of inflammatory secretions. Clinical experience also shows that a very slowly given retention enema brings prompt, though again only temporary, relief. I am convinced that this relief is mechanical and not the result of drugs added to the water.

It is both reasonable, and in conformity with radiological experience to suppose that a well-filled colon is at rest in its normal physiological condition exhibiting a gentle peristalsis and that an empty colon is in an unphysiological state associated with turbulent hypermotility and spasticity. In acute dysentery the bowel is

empty after the first few stools.

If these views are correct the obvious thing to do in acute dysentery would be to concentrate on forced feeding in order to fill the colon as rapidly as possible. One would thereby hope to establish conditions in which the colonic mucosa is spread over a soft fæcal mass containing the antidysenteric drugs. These would then be brought into much more intimate contact with the inflamed folds and recesses. The ulcerated areas would be prevented from rubbing against each other as they must do in an empty, hypermotile colon, depending almost entirely on the meagre protection afforded by its own highly contaminated secretions.

It seemed worth trying.

Accordingly, I replaced the usual sips of arrowroot conji, etc., by a thick, pasty mixture consisting of finely mashed potatoes, milk, butter and
raw eggs. Where eggs were objected to by wellnourished patients they were omitted. In undernourished patients they were replaced by a
proprietary protein concentrate. This mixture,
plain weak tea or barley water was presented
to the patients at three-hourly intervals. They
were persuaded to eat as much as they could
swallow. It was insisted upon that the more
they ate the sooner they would recover. In
occasional cases in which there was a strong
aversion to potatoes these were replaced by a
thick, strained porridge made of Quaker Oats
with butter and milk with or without raw eggs.

On this regime it very soon becomes evident that the speed of recovery is directly related to the amount eaten. In a good eater—averaging about half a pound or more per meal—it never takes longer than 36 hours for the diarrhea to be arrested with a sense of complete well-being. Mild and early cases are clinically normal in about 24 hours. There is usually no stool for the next 36 to 48 hours, though particularly over-co-operative patients may pass a normal, well-formed stool after 12 hours.

Occasionally, after cessation of the diarrhea, there is a pause of several days before the next motion occurs. Some such patients get alarmed thinking that their diarrhoea has changed to serious constipation. They must be strictly warned against resort to a laxative, enema or purge. The only directive I give is: 'Eat more and don't worry'. I have never found artificial assistance necessary, though I have had to be patient for as many as four days. The abrupt change from a typical, a feculent, dysenteric stool to a normal, formed motion, without any intermediate stages of amelioration, is a most striking experience. It has occurred in every case treated with forced feeding.

As soon as a normal stool has been passed the diet is relaxed in quantity and increased in variety. I allow the patient to choose his own menu with the following proviso: All food must be so soft that it can be made a homogeneous paste with the tongue. It must be free of all hard particles, fibres, skins, pips, etc. This restriction is purely mechanical. I do not allow pungent condiments nor alcohol for the next week but otherwise normal food can be taken after the fourth normal motion. I allow the patient to leave his bed after the second normal motion.

In emaciated and dehydrated cases, beginning treatment in an advanced stage, fluids and proteins must be provided at once and liberally, preferably by the infusion of reconstituted human plasma which can produce most dramatic results when combined with the regime

here suggested.

I happen to have made my observations on mashed potatoes and occasionally porridge. It is possible that any food of similar physical and nutritive properties could be substituted. The problem, as I see it, is merely to get the colon filled as rapidly as possible in a physiological manner with matter that will keep the lumen wide open and in fact perform the function of an antiseptic ointment on an ulcerative lesion.

In no single case have I had the impression that forced feeding with suitable food has had any other than a beneficial effect. Indeed, I am beginning to suspect that the incidence of late clinical 'amæbiasis' is far less common in patients treated according to this schedule, though that question lies beyond the scope of this article.

COMMITTEE ON INDIGENOUS SYSTEMS OF MEDICINE

(GOVERNMENT OF INDIA, MINISTRY OF HEALTH)

The following replies have been given by the Editor, Indian Medical Gazette, to Questionnaire No. III (for practitioners of Ayurvedic, Unani-Tibbi and Western systems of medicine) issued by the above Committee.

Questions .

- 1. What are the characteristics of the indigenous systems which specially commend them to the people?
- 2. What are the special features of the indigenous systems which give them a distinctive and pre-eminent value from the point of view of the health of the community?
- 3. Any special research on indigenous systems which you have carried out. Please supply copies of your research publications.
- 4. In addition to physical examination, are any laboratory tests or technique peculiar to the indigenous systems used by you?
- 5. Are you in favour of any control over the teaching and practice of the indigenous medicine on the lines of the control by the Indian Medical Council?
- 6. What measures would you suggest to increase the usefulness of the indigenous systems?
- 7. How can the measures suggested be made part of a comprehensive plan of medical relief?
- 8. How can the existing Vaidyas and Hakims be utilized, as an immediate measure, in any composite scheme of health service in rural areas?
- 9. What measures can be taken to improve the facilities for training in indigenous systems of medicine?

Should there be a uniform standard of teaching and examination of these systems all over India?

- 10. Should the students of the Western medicine be taught the indigenous system of medicine? If so, at what stage of their studies?
- 11. Are you in favour of evolving one system of medicine in India by a process of fusion of the Ayurvedic, Unani and the Western systems? If so, what are your proposals?

Answers

The nomenclature of diseases is understood better than the Western nomenclature and drugs used are also better known.

Symptomatic treatment is better and so is the contact between patient and the physician. The physicians are friends of the family.

Nil. Work has been done in Calcutta in the School of Tropical Medicine and in Bombay in the Haffkine Institute.

W. R. is demanded frequently in cases of leucoderma.

Yes.

Registration approved by the Council.

By allowing practice only to registered practitioners.

As in 6 and 7.

A modicum of anatomy and physiology of the Western system to be acquired compulsorily before starting study in indigenous systems. A state examination of the modicum is desirable.

Yes.

Post-graduate course or an additional course in therapeutics, compulsory or optional.

No.

Homeopathy has not been mentioned by the Committee. It is practised in India undoubtedly and is a Western system. Its practice may also be allowed subject to answer to question No. 9.

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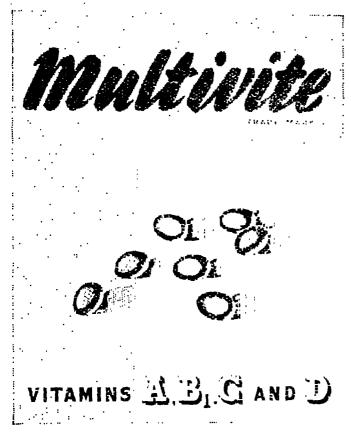
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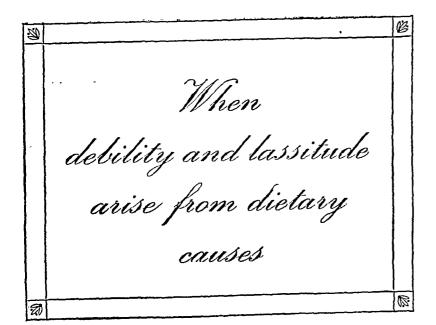
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THE

Indian Medical Gazette

MARCH

PLAGUE IN CALCUTTA

In picking up the thread of plague in Calcutta in March, April and May 1948, in this delayed issue of the journal for March 1948, we take the readers back 54 years. We can afford to do so leisurely and with digressions, as the epidemic has come and gone. Between 6th March and 25th May, both dates inclusive, there were not more than 147 cases with 30 deaths. The mortality was high in the first 14 cases. Later it was low.

In this 71 days long warp of public health activity in Calcutta there has crossed a woof of public sentiment, indicative of novelty, incredibility, excitement, panic, prophylaxis and assurance. Strands of panic were very few and far between. The sulpha drugs and streptomycin have deprived the fell dragon of plague of its teeth and claws. Our appraisal a few months ago (this journal, November 1947) of the antibiotic proved correct. The assurance preceded its actual arrival in the Infectious Diseases Hospital in Calcutta.

Hong Kong, Bombay and Calcutta 54 years ago.—In 1894 an editorial, entitled

THE PLAGUE IN HONG KONG, AND THE MEASURES TO PREVENT ITS INTRODUCTION INTO CALCUTTA.

appeared in this journal (Vital Statistics and Sanitation, 1894), then under the editorship of W. J. Simpson, M.D., M.R.C.P., Health Officer, Calcutta. The disease had not yet come to Bombay even.

Another important communication by the same worker entitled

PRECAUTIONS AGAINST THE INTRODUCTION AND

appeared two years later (Vital Statistics and Sanitation, 1896). The disease was then 'reported as being prevalent in Bombay'. A prepaid wire from the Officiating Chairman of the Calcutta Corporation to the Chairman of the Bombay Municipality had brought the following reply:

There has been a suspicious form of fever with enlarged glands in one locality, and one class for about three weeks; the mortality is small; it looks suspicious but by no means certain'.

The first case of plague in Howrah was then reported next month (Tomes, 1896). It was a mild case of Pestis Ambulans and had really been imported from Bombay. Then also appeared another editorial entitled

THE PLAGUE.

The disease now, 'notwithstanding the efforts of the sanitary authorities, seems to be holding its own in Bombay' (Editorial, 1896).

Another editorial in 1897 (Editorial, 1897a) finds fault with the Calcutta Medical Board for hiding plague in Calcutta. A death on 3rd November, 1896, in Raja Rajbullub Street had been assigned to 'either ordinary non-venereal buboes or . . . enlarged glands, fever, bronchitis and intestinal obstruction' In the same issue is denounced a similar attitude on the part of Bombay authorities in minimizing plague (p. 24), and is announced the occurring of plague at Karachi (p. 25) and in London, the infection spreading from Bombay.

'The attitude of the Medical Board is easily understood, and from many points of view laudable but when viewed from a wider aspect, it is a shortsighted policy and not likely to be in the best interests, either of the public or even of the mercantile community. We have an example in Bombay of a similar policy as that pursued by the Medicel Board and its results. Bombay concealed its first cases, then minimized them, and now it is face to face with a severe epidemic, its trade is ruined, and by its flying population it is likely to spread the disease far and wide'.

'The constitution of the Medical Board appointed for the purpose of preventing and checking the plague throughout Bengal has been the cause of considerable surprise and discussion. One would naturally expect that, in a grave crisis such as has to be dealt with, the most experienced sanitary and medical officers would have been selected as members of this Board. Instead of this we find the President, who naturally has the guiding of the deliberations and finding of the Board, a layman, with no knowledge whatever of the problems with which he has to deal. In addition to this, there are two engineers, a member of the mercantile community and three medical men, none of whom can be said to have had any special or extensive acquaintance with the manner in which epidemics require to be met and dealt with. The recommendations of such a Board cannot inspire confidence and are not likely to be efficient even if costly'.

'The name Medical Board may inspire confidence, but as applied to the present constitution of the Board, it is a misnomer and misleading'

That the safety of the Second City, in the face of a devastating epidemic in 1897, was in the hands of a tin-pot Medical Board will come as news to most readers at this rather distant date.

That is in a nutshell the story of the last visitation of plague in Bombay and its subsequent country-wide spread. It is also news to most readers at this distant date that the British mercantile community was indirectly responsible for the misfortune.

A special feature of the disease at this time was that a large proportion of cases suffered from Pestis Minor. The British regiment which had been at Hong Kong and was at this time in Calcutta also displayed the same feature. They 'showed non-venereal buboes in extraordinary numbers'.

As a matter of fact Pestis Minor had been causing confusion in medical circles in the Far East, Astraklian and Mesopotamia for some time (Editorial, 1897b). 'From Singapore, the Straits and along the coast of China, as far as Shanghai between the years 1891 and 1896, we have accounts of a singular affection of the inguinal glands which occupied the attention of the Singapore and Hong Kong branches of the British Medical Association'. Another form of glandular enlargement in the neck, in children, was considered a 'peculiar form of mumps' in the Far East and Astrakhan. It was infectious and accompanied by fever. In 1891-96 'in Hong Kong cases of fever of typho-malarial type occasionally presented in the third or fourth week a general enlargement of lymphatic glands which lasted for a week or ten days and then subsided'.

'Thus the more the matter is enquired into, the more evident it becomes that only in exceptional circumstances does plague immediately acquire epidemic proportions in a locality, and it appears that epidemics are more usually ushered in by the occurrence of a succession of mild cases of Pestis Ambulans.'

mild cases of Pestis Ambulans,'
The plague established itself in Bombay and Calcutta at last. The following table shows the toll it took for many years.

Of this human scourge which sprang into activity after nearly two centuries of dormancy India bore the brunt. In 20 years, 1898-1918, more than 10 million people died all over India (White, 1918-19).

End of last visitation on Calcutta.—Plague in Bengal and Calcutta was last heard of in 1925. It seems to have disappeared rather rapidly. Epidemiologists do not appear to have gone into this rapid disappearance, so absorbing have been kala-azar, leprosy, cholera, epidemic dropsy and even tuberculosis in this part of India.

Plague bacilli murder case.—Pakur murder case. That there is nothing particularly inimical to the Pasteurella pestis in the soil and air of Bengal was proved by this murder which stands unique in the annals of crimes of the world. Brotherly love ceased to exist between two half-brothers some time before 1933. In that year brother no. 1 sent a medical man to Bombay to obtain a culture of Pasteurella pestis from the Haffkine Institute. The medical man commenced work in Bombay, ostensibly on treating infected animals with a special cure and left rather abruptly with a culture in his possession.

On 26th November, 1933, at Howrah railway station brother no. 2, while waiting for a train to take him to Pakur, was pricked in the arm

Table
Plague mortality in Bombay and Calcutta

			THE RESERVE AND DESCRIPTION OF THE PERSON NAMED IN	
	Во	OMBAY	CA	LCUTTA
Year	Plague deaths	Mortality rate per 100,000	Plague deaths	Mortality rate per 100,000
1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934	1.936 11.003 16,821 15,860 13,285 18,694 13,786 20,751 13,504 14,171 10.802 6.379 5.348 5,186 3,641 3,997 1,714 2,605 2,935 698 1,982 1,698 1,133 697 281 801 629 1,329 409 1,744 56 207 257 29 20 24 44 48 31	24.2 1,385.2 2,130.0 -2,020.0 1,701.2 2,409.0 1,731.1 2,540.8 1,613.3 1,652.8 1,230.7 710.3 582.3 552.4 379.6 408.1 171.6 255.7 282.6 66.0 183.9 154.7 101.4 61.3 24.3 68.1 53.6 113.3 34.9 14.9 4.8 17.7 22.0 2.5 1.7 2.1 3.8 4.1 2.7	10 11 239 2,029 8,275 8,010 7,538 8,224 4,703 7,272 2,607 3,589 1,781 2,117 1,262 1,736 1,831 852 442 191 78 81 210 334 53 37 144 77 33 9	0.8 26.5 220.7 883.0 841.1 756 8 846.9 479.6 734.6 260.9 355.8 174.9 206.0 121.7 166.2 174.7 81.0 41.9 18.1 7.3 7.6 19.7 31.2 4.9 3.4 13.2 7.0 0.8

by a stranger who disappeared in the crowd. At Pakur he fell ill and returned to Calcutta for treatment on 29th November, 1933. In Calcutta he died on 4th December, 1933, and was certified to have died from septic pneumonia.

A culture of blood taken during the illness, at the School of Tropical Medicine, Calcutta, proved to be of Pasteurella pestis.

The case commenced, numerous medical witnesses were examined in the Court. Conviction followed. Brother no. 1 and the medical man were sentenced to death. The sentences were commuted by the Privy Council to penal servitude (Greval, in press).

1947 saw the end of the drama when brother no. I who had served the sentence returned and was killed in a civil disorder at Pakur. The medical man has also returned in time to study the epidemiology of a disease he should know pretty well.

Plague had disappeared so completely from this part of India that eminent physicians failed to diagnose it in the case of brother no. 2.

Older visitations on India.-1. An account of an epidemic in Northern India in the early part of the seventeenth century, from the diary of the Fourth Mogal Emperor, Jahanair (1605-1627).

PLAGUE IN INDIA IN 1618

THE RAT THEORY FORESHADOWED

(Reprinted from the Indian Medical Gazette, Vol. LIV, October 1919, p. 381)

THE thirteenth anniversary of the accession year on the throne, Moharram 1028 Hijra 1618 A.D.

By the submission of the repeated reports of the well-wishers, we have come to know that nearly one hundred persons die daily by the effect of the bubonic plague in Agra City. The people get exhausted by the coming out of a gland or blister in the armpit or on the thighs.

This is the third winter year that it inundates in the course of winter season, and subsides in the summer. It is curious, that, though this disease has prevailed throughout Agra, its vicinity, and near-by villages, yet no symptoms of it are ever seen in Fatchpur. Notwithstanding that the distance between Fatehpur and Amanabad is but 2½ kos (3½ miles). While the people of Amanabad have evacuated the infected village and are seeking immunity in these dominions, we deem it fit to reside ourselves in Fatehpur Sikri, as long as the disease is prevailing in the country. The ceremony of the anniversary of our birthday was held in Fatchpur.

Asaf Khan, the deceased, related a strange event occurred in the house of Abdullah Khan, son of Azam Khan. He said he had percolated (sic) the matter to Ahan. He said he had percolated (sic) the matter to the last. One day I perceived in the house yard a rat running hither and thither like a drunkard, quite insane, not knowing where to go. I hinted a waiting maid to hold the rat by the tail, and put it before the cat. The cat on seeing the rat jumped in with utmost desire, and caught the rat in her mouth, but at the same time dropped it, with disgust. By and by the symptoms of affliction and displeasure appeared on her symptoms of affliction and displeasure appeared on her face and she became in a precarious state. The thought of administering tiryak farook (a well-known medicine for poison) occurred to me. When her mouth was opened to give medicine it was seen that all her palate and tongue had become quite black. Having suffered from the unbearable pain for three days she recovered on the fourth. Thereafter a blister arose on the body of the maid who became restless by excessive pain and fever. Her colour changed from yellow to black. Her fever rose to the highest degree; consequently she exhausted her breath. In the same way seven or eight men died within a week.

I left the palace with my followers and resided in the garden. But no new blister arose to anyone there. Its contagious effect was so great that if anyone asked for water the supplier would become in the same calamity. At last all the men being suspicious began to get aloof from the poisons of this disease.

An abstract, from page 161:-

In this year, rather in the tenth year of the succession a great plague burst out in some localities of India, This plague arose from the Purganahs of Punjab, and reached in Lahore gradually. Most of the Mohamedans and Hindoos died of this disease. It reached the Doab of Hindostan Provinces between the rivers of Ganges and Japane. On appoint all the historical Ganges and Jamna. On enquiry all the historians, aged persons, and doctors said that this disease never occurred in the country before. Some say that the drought has effected on the ground.

It is God who has the knowledge of all destinies.

The man has but to obey the precepts of God. He has no power to do anything but to obey.

We are indebted to Lieut.-Colonel R. S. Turner. LM.s., of Mussoorie, for the above extract, from the diary of Jehangir. It was translated from the original Persian diary and sent to the late John Michael, of Frosby Hall, Mussouie, by one of his munshis in 1897.

It shows clearly the association of plague in those early days with rats and cats, and also evidences, its avoidance of the new, and therefore presumably clean. city of Fatchpur Sikri.

Evidently, the epidemic was plague and its conhection with rats was well known. The immediate effect on the cat and the maid are. of course, exaggerations inextricably bound up with the Court of the period.

2. Epidemic, in India, consequent on the invasions of Mahmud of Gazni (1000-1030) and others.-Epidemics are said to have come in the wake of these invaders. They, however, are not linked to the Black Death which originated in the interior of Asia about 1333 and spread all over Europe and Egypt (Dale, 1946). The Republic of Ragusa then imposed a period of observation of 40 days, Quarantina in Italian. on sailors landing in their ports. The modern word Quarantine is derived from Quarantina without regard to the 40 days.

Curiously enough, the epidemic which affected Europe did not affect India and the one affecting India did not affect Europe.

3. An epidemic in Egypt.—The following is abstracted from the May 1903 issue of this journal, giving an account of an Indian Expedition to Egypt (38, 184):

In 1801 an expedition was sent under Sir Ralph Abercromby to drive the French out of Egypt. An account of this expedition was published in 1802. . . . It contains some interesting notes on diseases in Egypt.

Plague.—This fever, now properly called epidemical, was long supposed to have been brought from Turkey in the ships charged with old clothes, which constantly came to Alexandria for a market; but these and similar reasons cannot any longer be maintained, since the plague has generated annually in Egypt during the last four years (although no such communication had been possible), and even chiefly commenced in

The source of this disorder must, therefore, be sought for in these phenomena with which the appear-

The plague commences in Egypt when the Nile begins to fall, and ceases to be fatal (almost to a day, many pretend precisely so), after the 17th of June, which is the period of the summer solstice, and when the Nile is supposed to receive the first increase.

As the waters of the Nile retire from the surface of the country they had inundated, a rich slime of considerable condensity is left . . . then corruption ensues, and continues until all the putrid juices are totally absorbed by the heat of the sun . . . the atmosphere at this time ceasing to be tainted, the plague throughout Egypt disappears.

None contend that the plague is not, like all fevers, more or less infectious, according to habit of body and duration in bad air; but that the disease hangs only in the atmosphere, or breath of the immediately afflicted patient, not to be conveyed by touch on a third

As a proof of the plague being confined to the atmosphere, independent of the examples its particular locality in Egypt offers, were mentioned several remarkable cases at Jaffa of men who, confined in the hospital of that town by the plague, escaped into the desert, and endeavoured to reach the army, but finding the attempt impracticable, returned again in three days, perfectly recovered.

In Cairo last year forty thousand people were supposed to be infected with the plague, and many of the French garrison died in that city, although the disease was treated in their hospitals with the greatest ability. The justly celebrated Dessaguettes was chief physician to the French army. The inspection of his hospitals obtained universal admiration, particularly the great one at Cairo. In Upper Egypt sixty thousand of the inhabitants perished during the same season. There, whole villages were swept away, and remained abandoned when the Indian army descended the Nile; but at the same time many instances occurred, when the nearest villages had not in them an instance of the malady.

Dr. White, an English physician, determined to discover if this malady, so destructive to a large portion of the globe, and which filled with apprehension the remainder, could not be checked, or rendered less virulent, by the introduction of inoculation. Resolved to become the patient of his own speculation, during the time the plague raged again at Rosetta (which it did towards the fall of this year, when numbers of sepoys died), he inoculated himself with matter taken from the buboes of an infected person. The attempt failed twice, the third proved fatal, in three days after the symptoms appeared, he died, falling a much-to-belamented victim to a disinterested zeal, benevolently and intrepidly directed for the benefit and happiness of the community.

In a return of sick in the appendix, it is stated that, during the expedition, 380 cases of plague occurred, with 173 deaths. This mortality, under 50 per cent, appears very favourable, in contrast with the death-rate of recent years in India.

4. Epidemics in India in the mist of antiquity.—On the whole the evidence pointing to their existence is very meagre and not even of the order assigned to the First Book of Samuel, Chapters 5 and 6, in respect of plague in the Middle East. The latter evidence, incidentally, is more a matter of sentiment than of proof. It is far from being 'unmistakable' as some writers regard it (Wilson and Miles, 1947). The people smitten by the Lord suffered from cmerods (= hæmorrhoids) and they gave as trespass offering golden images of emerods and mice. The trouble might easily have been due to schistosomiasis.

(I. SAMUEL

Chapter 5

6. But the hand of the Lord was heavy upon them of Ashdod, and he destroyed them, and smote them with emerods, even Ashdod and the coasts thereof.

7. And when the men of Ashdod saw that it was so, they said, The ark of the God of Israel shall not abide with us: for his hand is sore

upon us, and upon Dagon our god.
8. They sent therefore and gathered all the lords of the Philistines unto them, and said, What shall we do with the ark of the God of Israel? And they answered, Let the ark of the God of Israel be carried about unto Gath. And

they carried the ark of the God of Israel about thither.

9. And it was so, that, after they had carried it about, the hand of the Lord was against the city with a very great destruction: and he smote the men of the city, both small and great, and they had emerods in their secret parts.

Chapter 6

And the ark of the Lord was in the country of the Philistines seven months.

2. And the Philistines called for the priests and the diviners, saying, What shall we do to the ark of the Lord? tell us wherewith we shall send it to his place.

3. And they said, If ye send away the ark of the God of Israel, send it not empty; but in any wise return him a trespass offering: then ye shall be healed, and it shall be known to you why his hand is not removed from you.

4. Then said they, What shall be the trespass offering which we shall return to him? They answered, Five golden emerods, and five golden mice, according to the number of the lords of the Philistines: for one plague was on you all, and on your lords.)

A similar evidence may centre round mention of rats in Hindu mythology and even round Ganesh riding a rat.

Public opinion: 1. Co-operation by citizens.—
The people in Bombay, Calcutta and elsewhere co-operated with the public health authorities in submitting to search, quarantine, and inoculation with Haffkine's plague vaccine (made at Bombay). The recommendations of the Plague Commission were carried out with remarkable ease.

- 2. A set-back caused by short-cuts in manufacture of vaccine.—Only one accident marred the smooth running of the prophylaxis. At Mulkowal, in the Punjab, in 1902, 19 persons inoculated with the contents of one bottle died of tetanus. The vaccine had not been prepared in accordance with the routine. This disaster threw a shadow over Haffkine's life and seriously affected his career (Taylor, 1933).
- 3. Three discordant notes: (1) Kill fleas only not rats.—This was advocated by Colonel Dennys (Dennys, 1918) and supported by some careful workers. Some de-ratted villages had suffered while those with rats had escaped. The possibility of doing so can be realized now with DDT. In fact, in connection with typhus fever, flea destruction has been accomplished in America recently with DDT-dusting (Nicholson et al., 1948; Wiley, 1948).
- (2) Indian hakims opposed to the rat-flea idea.—

NATIVE HAKIMS AND THE PLAGUE
(Reprinted from the Indian Medical Gazette, Vol. 33,
June 1898, p. 230)

A MEETING of native hakims was held on Tuesday, 11th April, at Masti, Lahore, at which all the leading hakims of the city were present. The following resolu-

tions were passed :- 'Resolved that in the opinion of this meeting the bubonic plague is not a contagious disease. It originates from poisoned air, and this poison disease. It originals from account of atmospherical germs and the excess of terrestrial humidities. This poisoned and the excess of terrestrial humidities. This poisoned air affects and poisons the blood of such human by only as have a predisposition for its action'. 'Resolved that this meeting having carefully considered the Resolution of the Punjab Government (No. 43, dated 11th January, 1898), is of opinion that the rules embodied in that Resolution regarding the evacuation and isolation of infected area and the sick, suspected, and healthy persons being separately isolated and the disinfection of all property in the infected area and the disinfection of the houses before re-occupation are unnecessary under the principles of Unani medical science. Moreover, in the opinion of this meeting, to remove plague patients from the care of their relatives, friends, sympathisers, and their intimate attendants, and to throw them in a state of panic, horror, sensation or excitement (especially when they are inevitably in need of consolation, encouragement, comfort, and rest) only as have a predisposition for its action'. 'Reneed of consolation, encouragement, comfort, and rest) need of consolation, encouragement, comfort, and rest) must necessarily result in engendering the danger of death in their minds and to make the hope of their recovery faintest and remotest. Especially, in the case of dying and hopeless patients, to disturb them in their last moments of life by separating them from their friends and relatives, is to aggravate the pangs of their death and is against the feelings of human sympathy'.

—Civil and Military Gazette -Civil and Military Gazette.

It will be observed that the Western opinions on the genesis of plague in Egypt and Emperor Jahangir's opinion as given in his diary, were linked to soil though operating under different meteorological conditions.

(3) Opposition to inoculation in Calcutta.—

ANTI-PLAGUE BENGALI MEDICAL OPINION OF INOCULATION

(Reprinted from the Indian Medical Gazette, Vol. 33, June 1898, p. 230)

A LEADING Bengali physician, who should know better, has contributed the subjoined extract to the Calcutta Journal of Medicine against Mons. Haffkine's inoculation process. We wonder if the position taken up by him is the result of ignorance, or if it arises from a desire to play up to the gallery of his fellow-citizens during their inoculation scare.

'The following extract from the Lancet will show the following extract from the Lancet will snow how far these so-called prophylactic inoculations are the harmless and innocent things they are described to be. Though the germs are said to have been destroyed by heat in the serum, it has yet to be seen whether these inoculations may not predispose and lead to development of plague in expertionally excess. whether these inoculations may not predispose and lead to development of plague in exceptionally susceptible individuals, and in that case how terrible must be their consequences. Are people to be blamed if they fear that the plague, though it was non-existent in Calcutta, has been introduced potentially by the first inoculations performed in the city?'

It will be observed that what this opposition said fits in with the negative phase. The inoculation (especially a large one) is bound to exhaust the store of natural immune bodies in the blood and make the inoculated subject more liable, for a few days, to contract the disease. Although the significance of the negative phase in plague has been minimized by many field workers (Patel and Rebello, this issue, p. 151) the fact remains that immunologically it is sound (i) to put a few days between the inoculation and the risk and (ii) to prefer two small doses to a single large dose when there is no time to lose and no other mode of escape is

possible. Intending visitors to Calcutta from Delhi, for instance, should take the inoculation (i) ideally, 10 days before starting in 2 doses-1st dose 10 days previously, 2nd dose 5 days previously—and (ii) fairly safely, 5 days before starting in a double dose. In Calcutta those who took a double dose ran a greater risk than those who took two single doses.

The account of the epidemics and public opinion in some books on Indian History is not in accordance with facts. For an example is

quoted the following:

'Bubonic plague.—In 1897 two calamities fell upon India. First of all there was a failure of the crops. The Government mitigated the effect of this by means of relief works, but in the same year India was visited by the bubonic plague. Measures were taken to prevent it from spreading. For this purpose Government instructed medical officers to separate those stricken with plague from those who were well. The proposed did not understand the measures taken for their people did not understand the measures taken for their protection and resisted the medical officers. The conprotection and resisted the medical officers. The consequence was that the pestilence spread almost unchecked. It was worst in Bombay and the central part of India. In Madras the Government took precautions and prevented those from plague-stricken districts entering the Presidency and mixing with the people till they were proved to be free from the disease. In this way plague was kept out of the Madras Presidency' (Allen, 1943).

Present visitation.—The present incidence began on 6th March, 1948. The cases, it was hoped, were imported ones from Bihar. Local cases occurred but were missed. A suspected case was admitted into the Campbell Infectious Diseases Hospital on 17th March, 1948, but he decamped. Then came more cases who stayed and the reports of dead rats. Possibly the rats attracted attention at this period only.

The situation up to date (10th May, 1948) is

summarized as follows:

Dates	Ca	ıses	TOTAL	
6th March-19th April 20th April-30th April 1st May-10th May 6th March-10th May	•••	0- 2 4-14 1- 8 0-14	daily	17 93 37 147

More details are given elsewhere in this issue

(Lal and Seal, 1948, p. 145).

Rats and fleas.—There does not appear to be a dearth in Calcutta of these links in the chain of human plague (Strickland and Roy, 1930).

'Compared with other Indian cities, Calcutta possesses high general and specific flea indices and this flea factor is quite favourable for the spread of plague in an epidemic form, provided the other factors concerned in the epidemiology of plague are also favourable (Rao, 1941).

A note summing up the situation appears elsewhere in this issue (Roy, 1948, p. 149).

In the public health drive against plague the city has been cleaned generally, rats have been gassed and fleas DDT-dusted. It has been mentioned that it is possible to attack the fleas only without worrying about the rats.

which saved so many lives during World War II could be used on a wide scale only when means were found of transfusing blood, not only directly from donor to recipient, but indirectly to patients who needed blood to recover from an operation, an injury or an illness. Preserving blood, storing it in banks and despatching it over great distances solved the urgent war-time problem of supplying blood without delay to patients in need of it, wherever they were.

Collection service

Britain's human milk banks act as intermediary between mothers and infants, just as blood banks do between donors and recipients. There were indeed milk donors long before there were blood donors; but now the milk banks have made the donors and the infants, who are the recipients, independent of each other.

Mothers who will donate milk for unknown and, perhaps, unborn children, do not have to leave their homes to do so, for the milk bank runs a collection service. The milk is brought to the bureau and tested for taste and infectious germs; if it passes the tests, it is then pasteurized, cooled and bottled. It can be kept for many weeks, either liquid or in a dried state, in small cakes which can be turned into milk again

by the addition of water.

Thus prepared, the milk can be sent wherever it is needed to save infants who are either born prematurely, who are weak or who are otherwise in need of nourishment. Normally it is sent by road or rail, but in urgent cases it goes by air.

No milk groups

There is no proper substitute for human milk. Britain's milk banks provide aid in cases where formerly it would have been impossible or too late to help the necessitous child.

In appearance the human milk bureau at Queen Charlotte's Hospital resembles a laboratory, a cold store and a dairy. Most of the milk stored there has been donated by mothers who brought their children into the world at the hospital's clinic. The bureau gives them a small sum of money for every milk donation. Human beings are not divided into milk groups as they are for blood; healthy human milk can be fed to any infant. But before storage, the milk is tested for nutritive value in addition to germs and taste.

Fruitful experience

The London human milk bureau began to operate in 1938 as an experiment, and the experiment succeeded. Long experience has developed the most suitable methods of testing, pasteurizing and preserving the milk. The time has now come when this experience can be used on a large scale, not only in Britain but also overseas in those countries interested in the London milk service.

Generally, this bureau has served only certain western - districts of London. The new milk bank at Cardiff, which the municipal authorities have installed on the London pattern, will despatch human milk over long distances.

Other cities and towns in Britain are expected to follow this example shortly, and every new milk bank opened will be a further step to combat the infant m rtality rate.

RESTRICTIONS ON SALE OF QUININE SALTS RELAXED

(From a note issued by the Press Information Bureau, Government of India, New Delhi)

Ar present quinine sulphate, quinine bisulphate, quinine hydrochloride and quinine bihydrochloride imported under licence into India can be cleared from the Customs only after the importer has executed an agreement to sell 60 per cent of the consignment to Government at prescribed rates and to sell the remaining 40 per cent only to duly approved persons or institutions at prescribed rates. It has now been decided to relax these conditions. Hereafter consignments of these quinine salts imported under licence

can be cleared on the importer executing an agreement not to sell the quinine salts above the prescribed rates and to submit quarterly reports to Government showing how the quinine was disposed of.

Applications for import licences will continue to be made to the Chief Controller of Imports, New Delhi. Import licences will be granted subject to certain conditions which can be ascertained from the Import Trade Controllers.

SMALLPOX VACCINATION

Information has been received by the Director-General of Health Services that the Government of Ceylon have imposed quarantine restrictions on account

of smallpox against passengers from Nagpur.

In order to avoid being placed in quarantine on entry into Ceylon, passengers leaving Nagpur for Ceylon are strongly advised to be in possession of small-pox vaccination certificates showing that vaccination has been performed not less than 14 days and not more than three years prior to arrival in Ceylon. The certificates should be in the international form.

PLAGUE IN CALCUTTA

Information has been received by the Director-General of Health Services that the Government of Ceylon have added Calcutta to the list of plagueinfected ports.

CERTIFICATE OF PLAGUE REQUIRED FROM INDIAN INOCULATION PASSENGERS PROCEEDING ABROAD

Information has been received by the Director-General of Health Services that in addition to International certificates of vaccination against smallpox and inoculation against cholera, certificates of inoculation against plague (showing two inoculations with an interval of five days) are also required from Indian passengers by Iraq, Iran and Turkey and that such certificates should not be more than six months and less than six days after the second inoculation.

Such certificates are also required by passengers in transit through any of these three countries even if they are ultimately bound for U.K., etc.

INDIAN PSYCHIATRIC SOCIETY

THE Secretary writes:

Due to lack of public interest the majority of sufferers from mental disease in India are treated like animals rather than human beings. Many of their relatives prefer to wait until the very last, before having them admitted to a Mental Hospital.

There are very few facilities for the treatment of

patients in the early stages of insanity, when by modern methods, 80 per cent of cases can be cured sufficiently to live a normal life.

This state of affairs is not only inhuman; it is against religion, which imposes on man a special

against religion, which imposes on man a special responsibility towards the insane.

The Indian Psychiatric Society was recently formed in order to better conditions in Mental Hospitals, to increase the facilities for curative treatment, and to work for the prevention of mental disease both in India and Pakistan.

A guaranteely Indian Journal of Psychiatry will be

A quarterly Indian Journal of Psychiatry will be published next year and distributed free to all members.

- The following is a list of the office bearers:—
 1. Dr. Nagendranath De, M.B., D.T.M., M.R.C.S., D.P.M., President.
- Dr. J. Roy, M.B., D.P.M., Vice-President. Dr. R. B. Davis, M.B., M.R.C.S., Hony. Secretary

and Treasurer.

Medical men are requested to give us their support by becoming members of the Society. The fee for membership is Rs. 10 per annum. Forms for applications of the support of the society. tion for membership can be obtained from Major R. B. Davis, p.s.o., Hony. Secretary and Treasurer, Indian Psychiatric Society, Inter-Provincial Mental Hospital. Kanke P. O., Ranchi.

Public Health Section

AN INTERIM NOTE ON CERTAIN FEATURES OF THE OUTBREAK OF PLAGUE IN CALCUTTA DURING MARCH—MAY 1948

(CORRECTED UP TO 10TH MAY)

By R. B. LAL, M.B., B.S., D.P.H., D.B. and

S. C. SEAL, M.B., D.P.H.

Department of Epidemiology, All-India Institute of Hygiene and Public Health, Calcutta

THE Chief Health Officer of the Calcutta Corporation informed the senior writer on the 17th April, 1948, about a suspected case of plague in the Colootola area (Ward 8). A preliminary inspection of the affected quarters around Harinbari Lane, Colootola, was made on the same day, and on the 19th April, the place was again visited along with the officers of the Calcutta Corporation. The first case had obviously occurred at 20, Harinbari Lane in the first week of March 1948. This had not been reported. It was followed by three more cases in the same premises and several others in the neighbourhood within about six weeks. The second and the third cases were removed to the Campbell Hospital, while the fourth and the fifth cases which occurred one month after the first case were again missed. Most of these earlier cases proved fatal (8 out of 11) and yet they were not definitely diagnosed as plague. Apart from these a patient suspected of plague was admitted into the Campbell Hospital as early as the 17th March, but before the diagnosis could be confirmed he had left the hospital without permission and could not be traced. The first case of the series from the Colootola area to be definitely diagnosed as plague was the 11th case on the 17th of April, and soon after the 6th case was diagnosed post mortem.

Besides the inordinate delay in clinching the diagnosis and locating cases, during which period infection amongst the rodents had already spread widely, there are certain interesting features of this outbreak which need special mention. In the first place, no rat fall preceding the epidemic had been reported but on close inquiry it was found that the mother of the first patient had removed dead rats from her oneroomed house on the 8th, 9th and 15th April. A dead rat which proved infected was removed on the 19th April from a house where a definite case of plague had occurred and another clinically typical case (which was confirmed bacteriologically) was removed on that day from a house opposite. The question is whether rat fall had been missed or the epizootic occurred simultaneously with the epidemic. However, at more than one place in the infected area, the information that the rats had largely disappeared was made voluntarily by many householders. Another point of interest was that none of the earlier patients had been out of Calcutta for some months before the appearance of symptoms. It is also noteworthy that of the 17 deaths from plague that have so far occurred out of 211 suspected cases (64 of these are now believed by the hospital authorities to be other than plague on clinical grounds) as many as 8 took place before the 15th April when only 11 cases were recorded. As a matter of fact most of the later cases were very mild. So far only 74 cases have been considered as clinically typical, others being mild or doubtful; 28 cases have been found bacteriologically positive but all cases have not been so examined. If we exclude the 64 unconfirmed cases, the case fatality works out at 11.5 per cent. However, it was 72.7 in the early phase. This subject is of considerable epidemiological interest and we hope to follow it up. The notification appears to

Table I

The chronological order of 147 plague cases according to the date of first symptoms (between 6th March, 1948 and 10th May, 1948)

Date	Number of cases	Date	Number of cases	\mathbf{Date}	Number of cases
6th March, 1948 17th March, 1948 29th March, 1948 4th April, 1948 8th April, 1948 9th April, 1948 13th April, 1948 14th April, 1948 15th April, 1948 16th April, 1948 17th April, 1948 18th April, 1948	1 1 2 1 1 2 2 2 1 2 2 Nil	19th April, 1948 20th April, 1948 21st April, 1948 22nd April, 1948 23rd April, 1948 24th April, 1948 25th April, 1948 26th April, 1948 27th April, 1948 27th April, 1948 28th April, 1948 29th April, 1948 29th April, 1948	1 7 6 10 10 14 7 10 4 4 - 12	1st May, 1948 2nd May, 1948 3rd May, 1948 4th May, 1948 5th May, 1948 6th May, 1948 7th May, 1948 8th May, 1948 9th May, 1948 10th May, 1948	5 2 6 3 3 8 1 5 1 3 7

have improved considerably now, for only 4 unreported cases have recently been traced.

A perusal of the table shows that in the preepidemic phase which extended over 38 days there were occurring cases many of which had been missed. From the 20th April, the epidemic phase was manifest but it was mild both as regards the number of cases and their severity. By the end of that month decline commenced and now we are in the declining phase. How long it will last remains to be seen but from previous experience it would appear that it may last for another fortnight or a month. Of the 207 cases which have been removed to the hospital, 183 cases belong to the Calcutta municipal area and the rest 24 cases were brought from the suburban areas, viz, Hooghly 9 cases, Howrah 7 cases and 24-Parganas 8 cases.

Three-fourths of the patients are males and a large majority of them (87 per cent) are above 10 years of age; 104 or 70.7 per cent are Hindus, 45 or 27.2 per cent Muslims and 3 or 2.1 per cent Christians.

Provinces of origin.—West Bengal 44, Bihar 38, U. P. 14, Orissa 8, Rajputana and Merwar 5, Madras 2 and East Pakistan 34. This record

Table II

Ward-wise distribution of human plague cases (between 6th March, 1948 and 10th May, 1948)

Ward number	First case on	-	Number of cases	Ward number	First case on	Number o
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	28th April, 1948 22nd April, 1948 20th April, 1948 16th April, 1948 19th April, 1948 4th April, 1948 6th March, 1948 21st April, 1948 23rd April, 1948 21st April, 1948 20th April, 1948		0 2 3 6 15 1 4 19 12 2 10 1 5 4 2 0 1	19 20 21 22 23 24 25 26 27 28 29 30 31 32 Hooghly Howrah 24-Parganas	22nd April, 1948 1st May, 1948 22nd April, 1948 26th April, 1948 23rd April, 1948 29th April, 1948 21st April, 1948 21st April, 1948 30th April, 1948 30th April, 1948 30th April, 1948 30th April, 1948 24th April, 1948 24th April, 1948 27th April, 1948 29th April, 1948	 7 2 0 6 2 1 1 2 1 14 2 1 2 7 4 5

Table II shows that plague was originally confined to ward 8; later it spread to wards 7, 5 and 11 and then to other areas in succession; and by now suspected human plague cases have been removed to the hospital from practically all wards of the city except 1, 16 and 21. The wards arranged in order of incidence of plague cases is as follows: 8, 5, 28, 9, 11, 19, 22, 4, 13 and 14.

suggests that Biharis have been subject to greater incidence relative to their probable numbers in Calcutta population.

Occupation.—According to a broad classification the distribution of cases is as follows:—

(1) Liberal professions, tradesmen, clerks and shopkeepers—20 or 13.6 per cent.

(2) Artisans, labourers, venders, servants, peons and destitutes—73 or 49.6 per cent.

Table III

Age and sex distribution of 147 plague cases (between 6th March, 1948 and 10th May, 1948)

pathonica de la contraction de				Age						Total	Per cent
			1	-5	-10	-15	-20	-25	25+		
Male Female	 		1 0	6 3	4 5	20 3	17	19 6	44 12	111 36	75.5 24.5
	Тотль	•••	1	9	9	23	24	25	56 	147	••
				19 (13%)			128(87%)	•		

(3) At school-13 or 8.9 per cent.

(4) At home (mostly women and children)—

41 or 27.9 per cent.

Thus the majority of the cases occurred among people of lower economic status and amongst those staying at home. Since suitable data regarding the distribution of Calcutta population according to the above-mentioned criteria are not available it is not possible to say whether or not any particular group has suffered more than their due share.

The types of houses from which these cases

have been removed are as follows:-

Residential house 87, residential house cum godown 5, barrack 9, bustee 29, market 4, godown 3, mess or sarai 3, shop 3, cattle-shed, etc. (khatal) 2 and garage, etc., other places 2. As regards construction of houses from which plague cases have been removed, 76 or 51.7 per cent are masonry buildings, 29 or 19.7 per cent are tiled-roof huts, 14 or 9.5 per cent are thatched-roof huts and 28 or 19.1 per cent are sheds with roofs of corrugated iron sheets. Since we do not know the proportion of the different categories of houses in Calcutta we are not in a position to say whether the katcha houses or huts had more cases than others.

Distribution of single or multiple cases of plague in houses

Single or n	ultiple ca	ses	Number of houses
Single cases			134
Two cases		[3
Three cases			1
Four cases	• •	}	1

It is evident from table IV that multiple cases have been rare. This is surprising in view of the congestion and extreme insanitary conditions of the houses in which cases have occurred. Evidently this may be ascribed to low diffusibility of the organism or less favourable transmission factors.

It took sometime to set up a working organization for rat collection and it has not yet been possible to cover all the wards simultaneously.

Thus out of 891 rats examined 19 or 2.1 per cent showed evidence of plague infection. Of the positives 7 were R. rattus and 12 R. norvegicus. These had been collected from 9 different wards and one from Dum Dum area. The largest number of rats infected was found in ward 8, the area in which the first and the largest number of human cases have occurred. The rest of the infected rats were mostly collected from adjoining wards namely 4, 5, 6, 7 and 10. Nevertheless, rats from distant wards and from as far as Dum Dum area have been found positive which shows that rodent infection has already spread widely.

Only a few rats were available for examination of fleas during the first few days of investigation. However, the flea and cheopis indices rose from 2.5 and 2.5 on 19th April, 1948 to 11.5 and 4.0 respectively on 24th April, 1948. They came down to 5.7 and 2.9 on 29th April, 1948 and thereafter the indices have steadily declined and now stand between 1.0 and 1.5. It is interesting to note that the fastigium of the flea and cheopis indices and of human plague occurred about the same time in the present series of observations.

It is difficult to say whether the present outbreak in Calcutta heralds the beginning of a pandemic. There are some indications to that effect. For purposes of scientific investigation it should be treated so. Besides there are many problems which need investigation with a view to obtain the maximum results from control measures which are proposed to be instituted and also to check their progress. Investigations

Results of rat examination by wards (between 20th April, 1948 and 10th May, 1948)

Ward • number	Number of rats examined	Rats found infected with plague	Species of rats found infected	Ward number	Number of rats examined	Rats found infected with plague	Species of rats found infected
1 2 3 4 5 6 7 8 9 10 11 12 13	16 88 68 89 235 11 15 81 11 3 67 11 42 88	Nil Nil Nil 1 1 2 2 7 Nil 1 Nil Nil 2 Nil	R. rattus R. rattus R. norvegicus All R. norvegicus All R. norvegicus R. rattus R. rattus	25 27 28 Dum Dum Cossipur Howard	3 8 11 36 4 2 2 2 3 4 16 1 1 1 5	Nil Nil Nil Nil Nil Nil Nil Nil Nil Nil	R. rattus R. rattus R. rattus R. norvegicus

are also necessary to forecast probable happenings in the near future. They may also possibly throw some light on the epidemiological factors concerned with the periodicity of the disease. Such investigations have been projected.

In conclusion, a warning may be given. Fiftytwo years ago definite diagnosis of the first case of plague in Calcutta was made by Dr. Simpson, the health officer. It was not taken seriously. Epidemic followed. Plague had come stealthily to Calcutta in 1895, as it has come to us now. with a low fatality rate. In fact the nonvenereal buboes which had occurred amongst the Shropshire Regiment stationed in Calcutta in 1895 were not accepted by the army authorities as plague and the disease was ignored or suppressed for three years during which period its evolution was slowly proceeding. What was the result? Beginning from 1898 the annual mortality from plague had risen from 26.5 per 100,000 to 883 per 100,000 in 1900. ravaged the city severely for the next 10 or more years and disappeared only after 1925. What the Editor of the Indian Medical Gazette wrote in 1897 is of equal applicability to-day and may be quoted below:

'We had no desire of referring to Shropshire Regiment, but as the Medical Board has published the fact that cases of non-venereal buboes have occurred among the soldiers of that regiment, we cannot help remembering the fact that they came from Hong Kong in the beginning of 1895, that they were active in stamping out the plague, that fatal cases occurred among them, that they have suffered from non-venereal buboes ever since, and it is only since the coming of the Shropshire Regiment that difficulties in diagnosis regarding the buboes appear to have arisen. . . . The attitude of the Medical Board is easily understood and from many points of view commercial appears especially $_{
m the}$ laudable; but when viewed from a wider aspect, it is a short-sighted policy, and not likely to be in the best interests either of the public or even the mercantile community. We have an example in Bombay of similar policy as that pursued by the Medical Board and its results. Bombay concealed its first cases, then minimized them and now it is face to face with a severe epidemic, its trade is ruined, and by its flying population it is likely to spread the disease far and wide'.

A NOTE ON THE INVESTIGATION OF SUSPECTED PLAGUE CASES IN THE CAMPBELL HOSPITAL, CALCUTTA

By G. PANJA, M.B., D.Bact.

Professor of Pathology and Bacteriology
and
S. K. GUPTA, M.B.

(From the School of Tropical Medicine, Calcutta)

WE started investigation on 16th April, 1948.

Material was collected from 77 cases, although we took notes of 119 cases. Some were not evidently plague cases.

In the first few days of our investigation, we isolated Past. pestis from 8 clinically typical cases. The organism was identified in every positive case by morphological and staining reactions, biochemical reactions, agglutination with mono-specific anti-plague serum and finally by animal inoculation tests. Agglutination test on a slide proved highly useful in identifying the organism. Later we found that biochemical and animal inoculation tests were not necessary for identification. A gram-negative thick, short rod-shaped organism growing in characteristically sticky colonies and showing agglutinability with antiplague serum were sufficient for identification.

Bacteriological examination for Past. pestis proved negative in the remaining 69 cases. Streptococ. pyogenes was isolated in 2 cases, Staphylococ. aureus in 5 cases and Streptococ. viridans in 1 case—all isolated in pure culture.

Most of the cases in which plague bacilli were not found were clinically suspicious cases of plague. The negative findings might have been due to either of two causes: (i) the cases were of mild type; (ii) most of them were having sulpha treatment before the material was taken. It is interesting to note here that in one case Past. pestis was isolated even after 2 days' treatment with streptomycin.

All the cases were of bubonic type. In one case only was Past. pestis isolated from the circulating blood. In 3 of our cases, which proved fatal, no septicæmia was found, suggesting thereby that death was due rather to endotoxæmia than bacteræmia.

All bacteriologically positive cases came from one locality of the town, namely Lower Chitpur Road, Chunagalli, Rotu Sarkar Lane, Harinbari Lane, Canning Street, Jeliatola Street, etc. From no house more than one case came for admission.

It is also interesting to note that all bacteriologically positive cases that survived showed
presence of diagnostic agglutinin (from 1 in 20
to 1 in 320) in their blood from the 7th to the
10th day after illness. In the majority of the
bacteriologically negative cases, no agglutinin
was found. In 3 suspected cases only, although
bacteriologically negative, diagnostic agglutinin
was found against 4 strains of Past. pestis tested.
This is highly important as a diagnostic procedure, since puncture of a small deep-seated
bubo is difficult and bacteriological finding is
often negative. Moreover, most cases get sulphadiazine treatment before puncture is made and
therefore the chance of getting a positive result
becomes remote.

We found the recently isolated strains of Past. pestis most suitable for agglutination test. No auto-agglutinability was noticed. Both the slide method and Dreyer's method were adopted but the slide method was more convenient, timesaving, and gave clear-cut results. It must be mentioned here that the result of slide agglutination should be noted only a minute after intimate mixing of the bacilli with the diluted

serum. Twenty-four hours old nutrient agar culture subcultured from day to day acted as a good agglutinogen. A prepared saline suspension was found less suitable for slide agglutination.

We have kept an open mind in the bacteriologically negative cases showing no agglutinin for Past. pestis. We have injected materials into animals in the hope of finding some virus but so far nothing definite has been obtained. We also carried out Paul-Bunnell's test on a large number of sera but no clumping of sheep red cells in diagnostic titre was found. In conclusion, we like to lay stress on the point that for diagnosis an agglutination test must be carried out on all cases from the 5th to 19th day of their illness if bacteriological finding is negative.

A NOTE ON FLEAS AND RATS WITH REFERENCE TO PLAGUE IN CALCUTTA

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THE rat flea is the intermediate host of the parasites of bubonic plague. Fleas are regarded as free parasites as they remain on the host generally during the time they feed. The flea passes through the egg, larval, pupal and adult stages and the whole life cycle covers roughly three weeks. The eggs are deposited in places where the host rests. For egg-laying, the female usually selects dark and dry places such as rubbish, debris and dust in domestic houses, under the carpet, in godowns and granaries, etc. Rat fleas often lay eggs in rat holes. Fleas of either sex live exclusively on blood which is absolutely necessary for their own nutrition and also for the nutrition of the ovum. If fleas are unable to obtain the blood of the proper animal on which they are usually found, they may attack other animals. Under normal circumstances the rat flea will always be able to find a rat to return to, but where the number of rodents has been appreciably decreased which happens during an epizootic of plague among rats, the flea is driven by hunger to attack man.

The average flea is able to jump about 3 inches from the ground when gorged, and about 4 inches when starved. It is also capable of walking up a vertical sheet of glass for about 8 inches after which it falls back to the ground. Horizontally it is unable to cross a ditch 6 inches wide but it can remain afloat on water for

some hours.

The flea is unable to pierce the skin through ordinary cotton or woollen socks for feeding.

The duration of life not only of the adult flea but also of other active stages is influenced greatly by the two important factors, temperature and humidity. An increase of humidity and also of temperature has a tendency to retard the growth of all these stages.

The rodent flea, Xenopsylla cheopis, is the most concerned in the transmission of plague.

This flea is widely distributed in the tropics and is the principal plague flea in the oriental regions and also in Africa. It is widely prevalent in the plains in India. Xenopsylla astia, another rodent flea, also takes part in the transmission of plague.

A large number of surveys carried out in India have demonstrated the distribution of cheopis in relation to plague in India, in a broad sense, to be fairly constant. Where astia is in excess of cheopis, (1) the places may be plague-free, (2) a small outbreak may occur or (3) in certain localities this flea may also play the same rôle as cheopis. Where astia is the vector, it does so by its number and in such cases the epidemics are small and are seldom carried over to the off season.

The flea index represents the population of fleas on a single rat. This is determined by catching rats and collecting the fleas after killing both the rat and the fleas with chloroform. It, however, makes no allowance for the floating population of fleas at large in rat nests. It is generally assumed that the unknown proportion of fleas which exist on the rat's body is approximately constant.

In recent years two surveys of Calcutta rat fleas have been carried out. The first was by Strickland and Roy in 1930 and the second by Rao in 1941. Strickland and Roy obtained a low flea index, whereas Rao obtained a much higher

figure especially for cheopis.

The marked feature of the flea index observed by Rao was the wide variation from ward to ward and in the species of rodents from which the fleas were collected. Of the three species of rats present in Calcutta, Rattus norvegicus showed the highest flea index (9.0), while Rattus rattus and Gunomys varius showed a general flea index of 4.3 and 4.9 respectively. The house mice, Mus musculus, and Crocidura coerulea, the musk rat, showed a very low infestation rate.

The two most important species of domestic rats are Rattus rattus and R. norvegicus. The former is popularly known as the black rat and

the latter, the brown rat.

R. rattus.—The tail is often about one and a quarter times as long as the head and body combined; the eyes are large and prominent; the ears are large; muzzle narrow; tail uniformly dark; feet slender, white but sometimes dark. The colour in the Indian species is usually brown and the belly yellowish white. It is widely distributed in India. In Calcutta the proportion of this species of rodent is decidedly lower than R. norvegicus. It is a rat which lives in the house and is a good climber. This rat is much more dangerous than R. norvegicus from the epidemiological point of view.

R. norvegicus.—The tail is about 90 per cent the length of head and body. It is a heavy-bodied rat with a large heavy tail which is generally white or distinctly light in the lower half; ears and eyes small; the feet are large,

heavy and flesh-coloured; there are no long piles or bristles on the body. It does not spit or bristle when caged. It is a drain rat and visits houses at night. It is also a burrowing rat and a good swimmer.

When R. norvegicus is affected, the disease among men does not spread rapidly in the locality as happens when R. rattus is attacked. Further there is always a tendency for R. norvegicus to migrate and in this way the plague spreads to distant parts through this rodent and the disease assumes a sporadic character.

A SHORT NOTE ON PLAGUE CASES TREATED IN CAMPBELL HOSPITAL

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Indigenous plague cases have not occurred in Calcutta for nearly 50 years. The discovery of such cases this year is of some interest.

On 17th March a case was admitted with a history of fever for 2 days and enlargement of the inguinal glands. He was provisionally diagnosed as plague but he absconded the next This was an imported case, as he had come from Monghyr 2 days previously. sequently two cases were admitted from the same area, both residents of Calcutta, with fever and adenitis, on 9th and 30th April, 1948, respectively. The first case was toxemic on admission and died within 24 hours. The second case appeared to be in good general condition when admitted, but the clinical picture changed subsequently within 24 hours and he died within 2 days. In both cases gland puncture and blood culture taken during life were negative. Both cases clinically appeared to be plague cases. In the second case post-mortem examination was done and the diagnosis of plague was confirmed after histological examination of the glands.

On 15th April the third case was admitted from the same area with left cervical adenitis and slight fever. The patient was not toxemic and general condition was good. The physicians of this hospital as well as those of the School of Tropical Medicine and members of the All-India Institute of Hygiene and Public Health who were invited to see this case agreed that she was clinically a case of plague. The opinion was confirmed by bacteriological examination at the School of Tropical Medicine where P. pestis was isolated and identified from gland puncture material. This woman was the third indigenous case and the first case that was proved to be suffering from plague. She has been discharged

Subsequently a large number of cases started coming in, some mild and ambulant, others severe and septicæmic. Along with these many cases which later proved to be not plague cases were also admitted on suspicion.

The clinical features which were suggestive of plague were:—

Progressive adenitis—commonly involving the inguinal, sub-inguinal, axillary or post-cervical group of glands, without any ascertainable cause, the glands being visible, palpable and tender, with varying degrees of periadenitis. The diagnosis of clinical plague was only made after 3 days' observation, if no other cause of the glandular enlargement was found. With this, varying degrees of febrile reaction and toxemia were taken as additional diagnostic points.

Nature of cases

The admissions during the epidemic may be divided into 3 groups according to the periods in which they were admitted.

15th April to 21st April—when a very small number was admitted (11) and 8 of them were bacteriologically positive

bacteriologically positive.

21st April to 6th May—when a very large number was admitted. Many of them were not cases of plague. Seventy-one cases were diagnosed clinically as plague and only 6 of them were positive on bacteriological examination. Most of these were on treatment when cultures were made.

The latter period from 7th May to 25th May—when more serious and septicæmic cases started coming in and 21 cases were positive to *P. pestis* on gland puncture of whom 13 proved septicæmic on blood culture.

Of the cases 129 were diagnosed as plague and 78 as definitely not plague.

		Clinical	Bacteriological	TOTAL
Bubonic	••	84	35	119
Septicæmic		0	14	14
Pneumonic		0	0	0

Methods of examination

At present in all cases gland puncture and blood culture are being done. The aspirated material from the buboes is cultured on blood agar and \(\frac{1}{4}\) c.c. of blood of the patient is put on acid agar slope and incubated at ordinary room temperature. More than 1,000 colonies after 48 hours were found in severe septicæmic cases.

Methods of treatment

Three methods of treatment have been followed:—

- 1. Streptomycin injection (1 to 3 gm. per
- day for 4 to 7 days).

 2. Sulphadiazine orally (8 tablets initially and 4 tablets 4-hourly for 4 to 7 days).
- 3. Sulphamezathine (3 gm. by intravenous injection and 4 tablets 4-hourly for 4 to 7 days).

Results

- 1. Streptomycin .. 24 cases-7 deaths.
- 2. Sulphadiazine .. 71 cases—7 deaths.
- 3. Sulphamezathine 37 cases-4 deaths.

Only severe cases were selected for streptomycin treatment and two cases died within 12

hours on admission.

During the convalescent period the pain subsided and the glands became small, although they remained tender for sometime. In some cases diagnosed as plague clinically or bacteriologically the adenitis relapsed with fever in the second or third week of convalescence and the glands suppurated. From these suppurated glands no *P. pestis* could be isolated. In some cases organisms of the staphylococcus group could be found.

A rather curious feature is that all the deaths that have occurred so far are amongst non-Bengalis.

AN ASSESSMENT OF THE VALUE OF PLAGUE VACCINE (HAFFKINE INSTI-TUTE) AS USED IN A SINGLE DOSE MASS INOCULATION

(A FIELD ENQUIRY)

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PLAGUE vaccine is extensively used now as a routine control measure in various parts of the country where the plague epidemic is prevailing. There has been an impression among people including some medical men that the plague inoculation will give more or less complete protection when constantly exposed to the risk of plague infection in the affected area which is not correct and gives a false idea regarding the protective power of the vaccine. In fact, none of the dead bacterial vaccines could be relied upon to give absolute protection against an overwhelming infection and the same is true of plague vaccine. However, recently some public health officers and medical men in the province working in the field have doubted as to whether it is of any value at all as practised now in the field in a single dose inoculation of 2 c.c. (Simeons and Chhatre, 1946). With a view to clarifying the position a field investigation was undertaken recently in this province, where plague prevailed in an epidemic form in some districts.

Field investigations in assessing the protective value of a particular vaccine have certain inherent drawbacks in that all the conditions as one obtains in control laboratory experiments cannot be fulfilled in nature. Thus, in the field investigation one has to observe the course of epidemic as it occurs in nature, which may be limited or widespread and may be extended over a long period as in plague. Again, the

risk of infection cannot be accurately ascertained as regards the intensity and duration as it affects the inoculated and uninoculated groups. This is further complicated by factors such as emigration and immigration of new groups, people are not immunized simultaneously nor all of them before the start of the epidemic, etc. The present investigation, being not a pre-planned affair and being carried out after the subsidence of the epidemic, has an added disadvantage in that the records were not properly maintained and the enquiring staff had to scrutinize the information carefully and without prejudice to obtain the relevant data.

Information was collected in detailed standard forms by the district public health staff from 3,320 infected houses in 120 plague-affected villages and seven municipal towns in 5 districts. It relates to the plague epidemic of the last season only, i.e. year 1946. The data thus compiled were carefully sifted and analysed by one

of us (T. B. P.).

Accurate information on the state of inoculation about the persons attacked with plague was available from village records. In case of all other persons this was based on the information supplied by the persons themselves who were inoculated or the guardians in case of children. This was confirmed in many cases by the public health staff who had carried out inoculations at these villages. We also visited some places to satisfy ourselves regarding the proper recording of data by the staff.

In view of the limitations inherent in not preplanned enquiries like this, the data compiled this manner after careful enquiry may considered not unsatisfactory and undoubtedly dependable to arrive at broad conclusions. Inoculations were usually carried out by the public health staff, dispensary medical officers, and in some cases by the local medical practitioners. In all the instances a single dose inoculation was carried out and the dosage used was 2 c.c. for the adult and a proportionate one for the other groups as recommended by the Haffkine Institute. The vaccine used in all cases was a fresh one as it was issued by the Public Health Department without delay, on being received from the Haffkine Institute. may be further stated that not all the persons were inoculated at the same time in the villages. nor were they all pre-immunized, i.e. immunized before the start of plague infection in the village. Many times persons in a house were inoculated after the onset of a first case and these, therefore, are considered to belong to the group of uninoculated at risk' prior to the first case and 'inoculated at risk 'group later (though strictly speaking they would come under the second group a week later when the inoculation becomes effective; see the two paras below table III). Data regarding history of inoculation were available with regard to the inmates in houses, in which there were one or two attacks' of plague at different periods. In case of houses

with occurrence of more than two plague attacks at different periods, which were proportionately very few, definite information was available only regarding the time of first attack and the last attack, while that about the people inoculated after the second plague attack and before the last attack was not available.

It is observed that the people from the plague-infected houses sometimes evacuate it to avoid infection, but this evacuation is neither timely nor controlled and is very restricted during the monsoon period. The persons who evacuate from infected houses continue to be at risk whether inoculated or uninoculated as they carry plague-infected material along with their personal effects and as evacuation is not controlled they not infrequently visit their houses which they have supposed to have evacuated. These persons are, therefore, considered at risk and accordingly included in the respective two groups.

A distinction has been made regarding persons 'inoculated' and persons 'inoculated at risk' as also 'uninoculated' and 'uninoculated at risk' for judging the effect of vaccine. Only the groups at risk are taken for consideration. For

the distribution of their incidence is given in tables Ic and Id.

The value of plague vaccine is essentially determined by its effect in lowering the plague incidence, deaths and case mortality in the inoculated group when exposed to the risk of infection as compared to that obtaining in the uninoculated group under similar conditions

uninoculated group under similar conditions.

Details of total incidence, deaths and case mortality and also these by districts are given below in tables I and Ia respectively.

TABLE I

Total plague incidence, deaths and case mortality rates among 'inoculated and uninoculated groups at risk' for five districts where plague enquiry was carried out

Group	Attacks	Deaths	Case mortality, per cent
Inoculated	1,996	509	25.4
	1,985	1,005	50.6

Table Ia

Statement showing plague incidence, deaths and case mortality by districts among 'inoculated and uninoculated at risk'

			Inoculated			Uninoculate	CD .
District	·	Attacks	Deaths	Case mortality, per cent	Attacks	Deaths	Case mortality, per cent
Poona Belgaum Satara Ahmednagar Bijapur		602 733 372 161 128	118 187 119 56 29	19.6 25.5 31.9 34.7 22.6	530 341 711 268 135	250 141 394 156 64	47.1 41.3 55.4 58.2 47.4

this purpose an infected house, i.e. a house where a rat-fall or plague case has occurred, is taken as unit. All persons residing in such a house are considered at risk and of these those uninoculated and inoculated before the occurrence of first attack are included respectively in the groups of 'uninoculated at risk' and 'inoculated at risk ' and those inoculated later on, as they continue to be at risk, in the group of inoculated at risk. The number in each group is sufficiently large. The accurate information regarding factors of age and sex distribution, social, economic and environmental conditions are not available regarding the two groups. However, it may be noted that both groups being mostly consisting of people residing in villages and usually of agriculturist class having more or less similar social and environmental conditions, it seems that these factors are not likely to affect materially the broad conclusions arrived at. As regards the age and sex groups

The figures in table I indicate that the case mortality rate among the inoculated is markedly lower than that among the uninoculated. The difference in the case mortality rate among the inoculated and the uninoculated in the different districts as given in table Ia follows the same pattern as in table I except for the fact that the case mortality is higher in the two districts of Satara and Ahmednagar in both the groups, viz, inoculated and uninoculated. Table Ia would also indicate that the relative advantage to the inoculated (as compared to the uninoculated) is less apparent as the virulence of the epidemic (high case mortality) increases, Belgaum being an exception.

In table Ib are given the details of the population of infected villages by districts, total number inoculated among them, percentage of inoculated to the total population and case mortality rates among the inoculated and the uninoculated. Thus from the table it is

TABLE Ib

Percentage inoculations in the infected village populations by districts in relation to case mortality rate among the inoculated and uninoculated groups

District	Population of infected villages	Population inoculated	Percentage of inoculated population	Case mortality rate (among inoculated), per cent	Case mortality rate (among uninoculated), per cent
· 1	~2	3	4	5	6
Belgaum Satara Ahmednagar	 117.203 63.812 70,487 32,245 97,089	92,195 59,621 42,942 12,490 75,568	78.6 · 93.4 60.9 38.7 77.8	19.6 25.5 31.9 34.7 22.6	47.1 41.3 55.4 58.2 47.2

evident that Ahmednagar with the lowest percentage of inoculated population (38.7 per cent) appears to have the highest case mortality (58.2 per cent) in the uninoculated group.

The Belgaum district with the maximum percentage of inoculation (93.4 per cent) has the lowest case mortality rate (41.3 per cent) in the uninoculated group which would indicate that the epidemic in Belgaum is of lower virulence than in other four districts. Thus from the table it would seem to suggest that the greater the amount of protective inoculation carried out in a community, less virulent is likely to be the epidemic in such a community and vice versa within certain limits.

Tables Ic and Id similarly give the incidence, deaths, and case mortality by different age groups and sex.

It will be seen from table Ic that in the age group 'over 45 years' the case mortality rate is slightly higher than the other two age groups both among the inoculated and uninoculated. Also the case mortality rate in the age group 'between 15 and 45 years' among the uninoculated is much lower than the other two age groups in that column.

The difference in the case mortality rate of 19.6 per cent between the inoculated and the uninoculated in the age group of 15 to 45 years as compared to that of 28.9 per cent and 30.0

Table Ic

Case mortality rate by different age groups

		INOCULATED		Uninoculated			
Group	Attacks	Deaths	Case mortality, per cent	Attacks	Deaths	Case mortality, per cent	
Under 15 years Between 15 and 45 years Over 45 years	·· 830 ·· 949 ·· 182	222 247 54	26.7 26.2 29.7	621 1,007 320	344 461 191	55.4 45.8 59.7	
TOTAL	1,961	523	26.7	1,948	996	51.1	

Table Id

Case mortality rates by sex

Sex			INOCULATED		Uninoculated			
		Attacks	Deaths Case mortality, per cent		Attacks	Deaths Case mortality per cent		
Male Female		773 901	218 234	28.2 25.9	699 1,115	374 568	53.5 50.9	
Тотац	••	1,674	452	27.0	1,814	942	51.9	

per cent respectively in the age groups 'under 15 years' and 'over 45 years' would suggest apparently a greater advantage from inoculation to the latter groups.

Table Id indicates that males have a slightly higher case mortality rate in both the inoculated

and uninoculated groups.

It may be noted that sulpha-drugs (usually sulphathiazole) were extensively used in the treatment of plague cases in rural areas through the agency of epidemic and dispensary medical officers, private practitioners, through the Infectious Diseases Hospitals opened in various parts and also through the distribution of sulpha tablets by the public health staff. Many of the cases included in table I have thus been treated by sulpha-drugs. This is an added contributory factor in lowering case mortality figures. This would apply to both the groups, viz, 'inoculated' and 'uninoculated'.

Table II shows the case mortality figures separately for sulpha-treated and untreated groups among the inoculated and uninoculated groups.

The group inoculated-untreated has a mortality rate of 40.2 per cent as compared with uninoculated-untreated group which has a case mortality rate of 59.4 per cent. Thus, there is a difference of 19.2 per cent between these two groups. This difference has been found to be statistically quite significant and indicates that plague vaccine has been effective in reducing the mortality by 19.2 per cent below that obtained in the uninoculated group.

Table II indicates that sulpha-drugs have been effective in reducing the case mortality still further by about 20 per cent and hence sulphadrugs would need to be given equal importance in any plague campaign to prevent a heavy mortality from the disease. Table II also makes it clear that the contribution of sulphathiazole in lowering the case mortality in the inoculated and the uninoculated groups is not equal. Wagle (1944) found in his series of plague cases results such as 21.3 per cent in sulphathiazole-treated cases and 53.6 per cent in iodine-treated, i.e. non-specifically treated cases. Our results in the field compare well with this. He, however, does not

Table II

Case mortality rate separately for sulpha-treated and untreated groups among the inoculated and the uninoculated

	Treate	D WITH SULPH	A-DRUGS	Untreated with sulpha-drugs			
Inoculated or uninoculated	Attacks	Deaths	Case mortality, per cent	Attacks	Deaths	Case mortality, per cent	
Inoculated	1,586 1,262	344 575	21.6	410 723	165 430	40.2 59.4	
Total	2,848	919	32.2	1,133	595	52.5	

It will be seen that the most favoured group is the combined inoculated and sulpha-treated, having the case mortality of 21.6 per cent while the most adverse group is the combined uninoculated and untreated one with a very high case mortality rate of 59.4 per cent.

seem to have taken into account the beneficial effect of plague vaccine in assessing the results with various sulpha-drugs in his series.

Table III gives the figures of incidence, deaths, death rates and case mortality rates separately among the inoculated and uninoculated groups

TABLE III

Attack rate, death rate, case mortality rate and case mortality rate in the sulpha-treated and untreated groups among 'the inoculated and the uninoculated at risk'

Group	Number	Attacks	Attack rate. per cent	Deaths	Death rate, per cent	Case mortality rate (total), per cent	Case mortality rate in the sulpha- treated, per cent	Case mortality rate in the untreated, per cent
Inoculated at risk Uninoculated at risk	7,660 4,241	944 1,382	12.3 32.5	185 652	2.4 15.3	19.5 47.1	15.3 35.5	38.4 · 61.7

at risk as also among the sulpha-treated and

untreated ones. In this table in calculating the figures of attacks, deaths, etc., the persons attacked with plague (or dying) within 7 days of inoculation have been included in the column of 'uninoculated at risk' as they did not have time to develop protection from plague inoculation. It will be seen from the table that the attack rate of 12.3 among the inoculated at risk as also the death rate of 2.4 among them are lower than those in the group uninoculated at risk, which are 32.5 per cent and 15.3 per cent respectively. The difference of 20.2 per cent in the attack rate among the inoculated at risk is statistically significant and indicates that the plague vaccine is definitely of value in protecting the persons against getting an attack when exposed to infection.

Difference of 12.9 per cent in the death rate in table III between the two groups is also statistically significant and indicates that the plague vaccine is of value in lowering the death rate. The value of plague vaccine appears to be much better in its effect in reducing the death rate than in reducing the attack rate and is in part enhanced by the use of sulpha-drugs as is apparent from the last two columns of table III.

Table IV

Plague incidence and deaths among inoculated in relation to time interval after inoculation

		<u> </u>		
Time interval after inoculation	Attacks	Deaths	Case mortality, per cent	
Within 3 days Between 4 to 7 days.	78 89	38 22	48.7 24.7	
Between 8 to 15	177	42	23.7	
days. Between 16 to 30	349	63	18.5	
days. Between 31 to 90	639	153	23.9	
days. Between 91 to 180 days.	163	37	22 6	
Į		1]	

gives the details of plague incidence among the inoculated in relation to time interval after the inoculation. It would seem to indicate that there develops an adequate immunity by about the 7th day of inoculation. The case mortality figures of the first three 'time interval' items in the table do not seem to show any adverse effect of negative phase as was suggested by Simeons and Chhatre (1946) in their series. Figures for the towns are also similar ones. In this connection it may be stated that conclusions arrived at from the laboratory experiments carried out at Lister Institute (Schütze, 1939) suggested that inoculation carried out during the incubation period in case of typhoid fever would do no harm on that account. The same would seem to be true in

case of plague inoculations and hence inoculations should not be refused to the contacts on that ground.

Summary and conclusions

1. A field investigation to assess the value of plague vaccine was carried out in 5 districts in 120 villages and 7 municipal towns affected during the plague epidemic of 1946.

2. In all 3,320 plague-infected houses comprising 3,981 plague cases were examined and

data recorded from them analysed.

3. Plague vaccine as used now in a single dose has been found to be of definite value in that it reduces the case mortality rate in the inoculated by about 20 per cent when compared to that in the uninoculated group. This effect is apart from that due to sulpha-drugs which has been separately assessed.

4. The attack rate and death rate in 'inoculated persons at risk' are lower than those in 'uninoculated group at risk' and are statistically significant and indicate that the plague vaccine is of value in reducing the attack rate and death rate. However, the reduction in the attack rate

observed is not marked.

5. Sulpha-drugs were used on a large scale in the treatment of plague cases in the field during the epidemic and have showed their remarkable value in reducing the death rate considerably and thus have established an equal claim with the vaccine in the control of heavy plague mortality. Ideal thing appears to be to protect persons with plague vaccine and also to provide treatment facilities with sulpha-drugs in plague-affected areas.

6. There seems to develop an adequate protective immunity response by about 7 days of inoculation. There was no adverse negative phase effect observed among those inoculated after exposure to infection and hence it would seem unwise to refuse inoculation to contracts from fear of negative phase effect.

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RECENT OUTBREAK OF PLAGUE IN CALCUTTA

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PLAGUE is not a new-comer to the city of Calcutta. About half a century ago it made its appearance in the city in April 1898, commenced to exact its toll and the city was declared to be infected on 30th April, 1898. The city continued to be visited by this disease in an epidemic form for more than a decade afterwards, mainly during the months of January to June, having the highest attack and death rates in March-April. During the last 25 years or more, however, there is no record of any indigenous plague case in the city. The few cases and deaths recorded were amongst persons who had contracted the infection in a plague-infected locality outside Bengal. It was, therefore, a complete surprise for all when indigenous plague made its presence felt in the city for the first time after a respite of more than a quarter of a century.

Since the middle of March 1948, a few cases in the city were suspected by some private medical practitioners to be cases of plague. The first patient, diagnosed to be suffering definitely from an attack of plague, was removed to the Campbell Hospital on 15th April, 1948, from 20, Harinbari Lane, Ward 8. The patient, Bibi Darjafan, Mohammedan female, 40 years of age, had been in Calcutta for four months past and provided the first recognized instance of indigenous plague in the city during this year. Instances of other indigenous cases followed and with mounting panic the number of admissions of suspected cases into the Plague (Observation) Ward in the Campbell Hospital began to rise progressively. Between the 15th and 21st of April, there were only 14 admissions, four of which were definitely not plague cases. disease so far was confined mainly to Ward 8 and its adjoining locality. Between the 22nd and 28th of April, 1948, there were 109 admissions of suspected cases. The patients at this stage came from widely scattered places all over the city even from outside the city limits. The number of admissions of suspected patients reached the peak of 24 in a day during this Then the number of admissions started From the 29th April to 5th of May, 1948, there were 51 admissions. Since the middle of April till 12th of May, 1948, there have been in all 216 admissions of suspected cases into the Campbell Hospital of which 74 have been diagnosed as not plague. Of the 142 cases diagnosed as plague, 23 were bacteriologically confirmed. From 13th May to 31st May, 25 more suspected cases have been admitted. The more suspected cases have been admitted. total deaths up to 31st May amount to 13.

As plague had been non-prevalent in the city for the last quarter of a century or more, the authorities had no operational staff or detailed programme of work for specifically fighting this disease. But they rose up to the occasion and took the following measures promptly:—

1. Isolation and treatment of patients in the

Campbell Hospital.

2. Prompt disinfestation with D.D.T.

3. Epidemiological investigation and examination of rats under the supervision of the All-India Institute of Hygiene and Public Health.

4. Mass inoculation.

The special features of this present outbreak have been that:

1. The case mortality was strikingly low.

2. No abnormal rat-fall, indicating presence of an epizootic plague, was noticed, though certain proportion of rats collected from different localities and examined at the laboratory of the All-India Institute of Hygiene and Public Health has been found to be infected.

In this connection it would be worth while to consider the number of attacks and deaths for five years since 1898, when plague made its first

appearance in the city.

1898 1899 . 1900 1901 1902 .. 247 Attacks 2,467 8,822 8,611 7,781 Deaths .. 203 2,341 8,278 7,883 7.278

It thus appears that though plague had a modest start in the first year of its visit it exacted a much heavier toll in the succeeding years. The attacks have been comparatively light so far but we must be prepared to meet the eventuality of any recrudescence of this disease in a more severe form.

The authorities are fully alive to the situation. A comprehensive scheme for fighting this disease has been worked out and is awaiting sanction.

CLINICAL IMPRESSIONS OF A SECOND PLAGUE EPIDEMIC IN THE SAME TOWN

By D. SHAMANNA, R.A., M.B., R.S.

Assistant Surgeon, L. F. Hospital, Saklaspur
and

MISS MARY KALAPPA, I.M.P.

Sub-Assistant Surgeon, Maternity Hospital, Saklaspur

The town of Saklaspur in Hassan district, Mysore State, with a population of 4,000 was visited by an epidemic of plague for a second time in August 1947, following the previous one in 1946 which had lasted from March to October, after a brief respite of about 9 months. A clinical account of the first epidemic was presented in October 1946. A brief clinical resume of the recent epidemic is set down in this paper.

The first case in the town was seen by one of us in August 1947. She was a Muslim girl aged 13 years, a local inhabitant, not having gone to any infected locality nor come in contact with any infected person. She had an axillary bubo and a temperature of 100°F. To diagnose this

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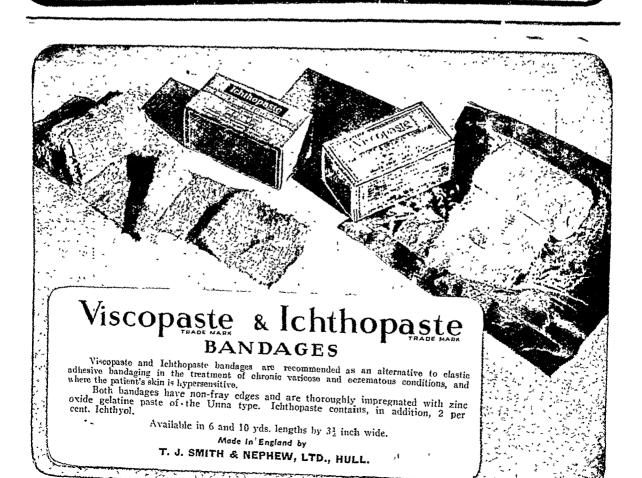
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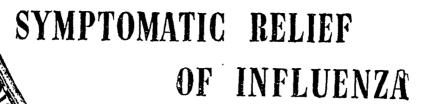
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case as plague and report it to the municipal authorities as such called for much circumspection on the part of one of us (M. K.). Next day in a neighbour's family two cases of adenitis and fever were sighted, and on the third day in the same locality a boy took acutely ill with fever and an enlarged femoral gland. Now there was no doubt that plague had set its foot on Saklaspur soil, though the source of infection was not clear. At this stage reports of rat falls here and there reached the authorities. Not that there were no rat falls a few days prior to the occurrence of the first case but due notice had not been taken by the public. Dead rats were now sent for examination from several houses and they were all found positive for B. pestis and thus the whole town became alive to the fact that the epidemic had come again.

Soon after the first case was reported—thanks to the public health department and the town municipality-public health measures were promptly instituted, viz, cyanogassing, disinfection and plague inoculation. A distinct difference in the attitude of the public was noticed during this epidemic to the public health measures. The apathy and disinterestedness exhibited by them during the previous epidemic were not to be seen. The public welcomed the public health measures, and readily and willingly lent their co-operation as they were now convinced by their past experience of their use-This favourable public attitude was one of the encouraging factors in stemming the tide of the epidemic in its early stages. Within 10 days of the onset of the epidemic 95 per cent of the population of the town had the protective inoculation.

There were in all 17 attacks. Nine cases came directly under our care, and the remaining ones we had an opportunity to watch through the courtesy of colleagues. Ten were males and 7 females. Regarding the ages of the affected individuals 7 were below 10 years of age and the remaining were adults from 18 to 30 years.

Excepting 2 severe cases—septicæmic ones—the clinical picture in the remaining 15 cases was nearly the same, viz, a moderate degree of fever and definite enlargement of one or other lymphatic gland, femoral gland being involved in the majority of cases. The enlarged gland was tender and associated with periadenitis. Other signs and symptoms like injected conjunctivæ, dullness and gastro-intestinal disturbances were not to be seen.

All the cases were treated by sulphathiazole in their own houses, the dosage being that suggested by Mathur et al. (Indian Medical Gazette, August 1945). The drug given was either thiazamide or cibazol tablet. It was started with an initial dose of 2 grammes followed by a maintenance dose of 1 gramme every 4 hours, making a total of 7 grammes in the first 24 hours. On the 2nd and 3rd days, the dose was reduced to 4 grammes, i.e. 1

gramme every 6 hours. This was further reduced to 3 grammes from 4th to 6th day, making a total of 24 grammes as the basic standard dose. Children of 8 to 14 were given half the above dose and in smaller children the dosage was correspondingly reduced. This basic standard dose was given even when the patients became apprexial on the 2nd or 3rd day of the attack. In all cases attention was paid to adequate fluid intake. Rarely had we to resort to the use of glucose, soluseptasine, coramine or even tincture digitalis.

Unlike the previous epidemic we had no difficulty in inducing the patients to take the full dosage of sulphathiazole. The people had taken to this drug kindly on account of its proved benefits as witnessed by them in the previous epidemic. The municipal authorities made a free distribution of these pills to the poorest of patients. Even the hakims and vaids had shed their prejudice with respect to the sulpha drug and given up their indigenous remedies in favour of sulphathiazole. In a few instances the lay public had themselves purchased the 'Plague pills' as they referred to cibazol and administered a couple of them to the patient before the doctor saw the case. Though we had read accounts of the superiority of sulphadiazine, sulphathiazole still held the field in this epidemic primarily on account of the popular support given to it.

In all the bubonic cases the patients became apyrexial on the 2nd or 3rd day of the onset of the fever and adenitis. In none of the cases did the buboes suppurate though it took a variable period from 10 days to a month for the pain and swelling to subside completely.

No complications were met with in any of the bubonic cases. With the exception of two septicæmic cases, in all the bubonic cases, patients made an uneventful recovery, so much so that the seriousness of the disease was totally lost on the populace.

Most of the inhabitants of the town had been inoculated in March, April and May 1946, and out of 17 attacks in 1947, all had the benefit of the 1946 inoculation. Excepting the two individuals that died the remaining had been inoculated recently too (August 1947). The two deaths were clinically amongst the septic-emic type, and both were adults.

As against 17 attacks and 2 deaths in this epidemic (1947) there were 26 attacks and 6 deaths in the previous one (1946).

The mortality rate in this epidemic was very low. The epidemic itself might have been a mild one. There might have been a residual immunity in the population conferred by the 1946 inoculation. The public health measures instituted—cyanogassing, disinfection and inoculations—were very prompt and efficient. All these factors served to check the spread of the epidemic. The immediate exhibition of the sulpha drug in adequate dosage was perhaps

largely responsible for reducing the death rate amongst those that were attacked.

Our thanks are due to all colleagues who with unfailing courtesy acquainted us with the cases under their treatment.

Addendum to 'Mirror of Hospital Practice'

PLAGUE IN CALCUTTA

REPORT OF THE FIRST CASE DIAGNOSED WITH PHOTOGRAPHS OF THREE OTHER CASES

By R. N. CHAUDHURI, M.B., M.R.C.P., T.D.D. Professor of Tropical Medicine

and

H. CHAKRAVARTI, M.B. Assistant Research Officer

(Department of Tropical Medicine, School of Tropical Medicine, Calcutta)

On the 16th April, 1948, the Director of the School received an urgent letter from the Superintendent of the Campbell School and Hospitals intimating that four patients suspected be suffering from plague were lately admitted there, one after another, all being Mohammedans from a particular locality of Calcutta. Of these the first patient who had come from Monghyr and developed fever on the second day of his arrival in Calcutta, absconded soon after his admission into the hospital; the second and the third patients died in the hospital but as stated in the letter bacteriological examinations of blood and aspirated material from glands revealed no specific organisms, and autopsy of a gland was also negative. senior author was asked in that letter to see the fourth case which was admitted on the previous night with a view to excluding or confirming the diagnosis of plague.

We went to the Hospital and examined the case which was a woman aged 40 years. She was uneasy, apathetic, dehydrated and markedly prostrated and answered to the questions reluctantly in a feeble voice. She, however, could give the history and stated that the fever had begun five days before her admission into the hospital, followed by a swelling in the left side of the neck one day after the onset of the fever. The swelling was however gradually increasing. She also complained of extreme

weakness and pains all over the body.

The temperature on admission was 102°F. and during the time of examination was 100°F. with pulse rate 120 and respiration rate 40 per minute. She was moderately toxemic; there was slight photophobia but eyes were not congested. The tongue was thickly coated and dry and she had no inclination for food. Heart sounds were clear and no adventitious sounds were audible in the lungs. The spleen was palpable half an inch below the costal margin. The abdomen

was soft, bowels were constipated and the urine was diminished in quantity. There was no neck rigidity, pupils were equal and reacting, knee jerks and abdominal reflexes were normal.

A diffuse swelling was noted in the upper and lateral part of the left side of the neck, extending from behind the angle of the mandible to the upper angle of the posterior triangle across the upper third of the sternocleido mastoid muscle. It was oval in shape, about two and a half by two inches. A photograph was taken but unfortunately the swelling was not very clear in the picture, hence a sketch diagram is given below (figure 1) indicating the position of the swelling. It was slightly

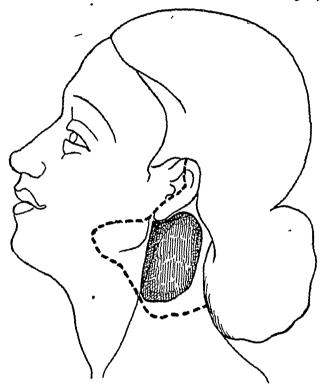


Fig. 1.

tender and the area was red and hot to the touch. The overlying skin with subcutaneous tissue was ædematous, giving a soft and boggyfeel and no discrete gland could be palpated through it. In general the swelling did not appear very much different from a local inflammatory swelling or septic adenitis. It was punctured and a little purulent material was obtained.

No malaria parasites were seen in the blood but there was definite polymorphonuclear leucocytosis. The gland puncture was positive for Pasteurella pestis. The patient was having penicillin injections and 'cibazol' in small doses. She was given sulfadiazine 2 gm. in our presence with instructions to repeat the dose every four hours, and an intravenous glucose saline drip was also advised. The temperature became normal after five days but the swelling persisted for several days afterwards when we learnt she was given a course of streptomycin. The patient recovered uneventfully.

The chief interest in publishing this report lies in the fact that this was the first case

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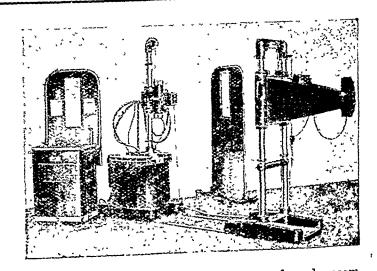
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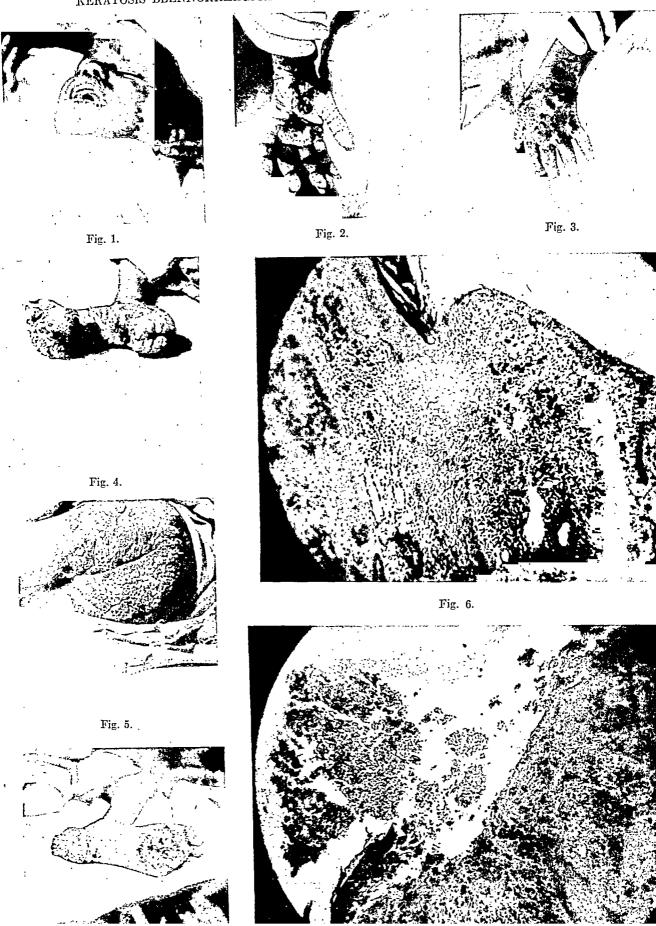


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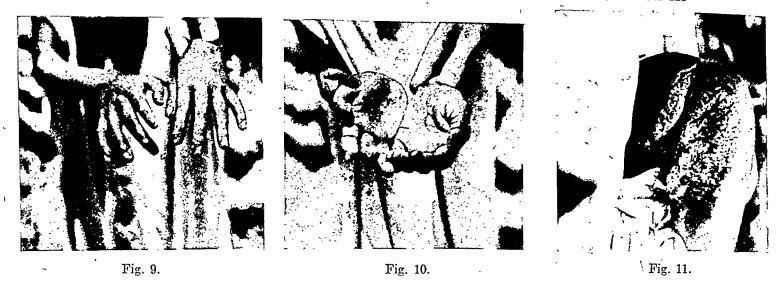
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KERATOSIS BLENNORRHAGICA : E. W. GAULT & E. I. GAULT. (O. A.) PAGE 123



PLAGUE IN CALCUTTA: R. N. CHAUDHURI & H. CHAKRAVARTI. (M. H. P.) PAGE 158



Fig. 2.



Fig. 4.

It is regretted that these three figures are not very distinct.—Editor, I.M.G.

diagnosed in the recent outbreak of bubonic plague in Calcutta. The patient had a moderately severe infection with a bubo occurring in the cervical region, a relatively infrequent site (5 to 10 per cent). She had the infective flea bite probably about the area shown in dotted lines (figure 1).

In a subsequent visit we took photographs of three more patients with bubonic plague, one had the bubo in the neck, one in the inguinal region, and another in the axilla. These are also reproduced in plate VIII, figures 2, 3 and 4,

with the above case report.

Our thanks are due to the Superintendent, Campbell Hospital, for referring the case to us and to Dr. S. K. Gupta for assistance.

The Indian Medical Gazette Fifty Years Ago

PLAGUE ADMINISTRATION

(Reprinted from the Indian Medical Gazette, Vol. 33, March 1898, p. 102)

The volume containing the reports of the Bombay Municipal Commissioner and the Health Officer on the Plague in Bombay in 1896-97 will, we venture to think, be found of more than passing interest. Already in Bombay, as far as the mere date of publication is concerned, the volume is somewhat ancient history, but the lessons the reports teach in the difficulties of dealing with epidemics will remain matters of public interest until the obstacles on which the reporting officers have so happily put their fingers shall have vanished in an improved atmosphere of public appreciation of the

problems of sanitary administration.

The first problem that Mr. Snow has found unsolvable in dealing with the Bombay epidemic is that of tracing the source and time of occurrence of the first few cases; the existing machinery for disease- and death-registration proved entirely untrustworthy and, in fact, useless; and when we consider the system in force at the time (it is happily altered now) this is not to be wondered at. There was no skilled supervision of deathcertification; the diagnosis of the cause of death was made by the relatives with the assistance of an uneducated clerk at the door of the cemetery with the not unnatural result that the mortality statistics of the city of Bombay in the early months of the first epidemic presented phenomena in the incidence of disease on an urban population which, had they been expounded by any D.P.H. candidate, would to a certainty have caused him to be referred to further study.

The result to the city of this lamentable defect in the registration system was briefly that it was impossible to locate the first cases of the disease,

a measure which, had it been capable of successful accomplishment, would have saved the city from the scourge that has fallen upon it. That this is no idle dream has been proved again and again in the history of the plague in small mofussil towns and districts, and notably by the history of the Hubli outbreak, where the accurate location of the earlier cases by Surgeon-Captain C. H. Meyer enabled him, to use his own expression, to get ahead of the plague, and by timely removal of cases and evacuation of infected dwellings to entirely eradicate the scourge.

The next few paragraphs of Mr. Snow's report deal with the trouble experienced in keeping the large menial staff of the Health Department at their work, and we can only express our sympathy with him in the uncommonly difficult position in which he found himself. The only point which here appears to offer itself for enquiry is as to what system of discipline is in vogue under which the men can in so short a

time become so out of hand.

With regard to the hospital question there can be no two opinions; at the time of which Mr. Snow is now writing, the Arthur Road Hospital was, as Dr. Pechy-Phipson pointed out, anything but a fit place in which to treat infectious or any other disease. Both the medical and menial staffs were deficient in number, nursing there was none, and, putting all other considerations on one side, this is the one detail of the hospital staff which should not be wanting in a plague hospital. It is not now our intention to pass in review the deficiencies of the Arthur Road Hospital; that it was an entirely inadequate, ill-equipped, and undermanned institution no one will be bold enough to deny, and we say this without in the least wishing to detract from the reputation that the one medical officer worthily acquired for his devotion to duty. Enough has been said to demonstrate that the popular fear of the hospital was not a groundless one, and that, through neglect which might be mildly styled culpable, the building which should have been looked to as a house of refuge was with far too good reason avoided as a charnel-house.

We have not space to pass in review the various interesting points brought forward by the reporting officers; we cannot, however, refrain from remarking that in the Bombay of this year with the new system of caste hospitals, the bugbear of hospital dread appears to have been in great measure absent. We might further point out that this result would have been sooner and better attained had the leaders of the native community shown a more intelligent appreciation of their public duty at the earlier periods of the epidemic. It was unfortunate that at the beginning of the plague the infectious disease hospital should have resembled a pair of miserable sheds; but it was, a situation that might have been saved by a reasonable grasp of the situation by those best qualified to take it;

nothing of the kind happened, and hence we have, on the one hand, a history of riotous behaviour on the part of the mob, and on the other, a picture of masterly inactivity which may be fairly held responsible for the natural irritation of the uneducated mill-hands who attacked the hospital.

In conclusion, it must be confessed that the two crying needs demonstrated on the first few pages of the Commissioner's report are: first, the need of an efficient system of death-registration in order to ensure early detection of an epidemic; and second, the maintenance in an efficient condition of accommodation for, at any rate, the earlier cases of the disease when it makes its appearance.

Current Topics, Etc.

The Sulphone Treatment of Leprosy

By E. MUIR

(Abstracted from the British Medical Journal, i, 7th June, 1947, p. 798)

THE drugs commonly known as sulphones are deriva-

tives of diaminodiphenyl sulphone.

It was their antibiotic effect in controlling the growth of M. tuberculosis in experimental animals and in vitro that first suggested trial in leprosy. Strangely, they have so far shown much more evidence of usefulness in leprosy than in tuberculosis.

Mode of administration

Dosage.-Author's experience has been chiefly with diasone, and the dosage here described is what is recommended in the use of this drug.

Diasone is generally made up in 5-gr. (0.32 g.) capsules or tablets. When the hæmoglobin is at or over 70 per cent begin with 1, 2 or 3 tablets according to the general condition of the patient. This should be taken in one undivided dose, preferably an hour after food, so as to promote quick absorption and the highest blood concentration. Reactionary signs are not a contra-indication to beginning the treatment, but are a warning not to raise the dose too rapidly. Whatever the initial dose, repeat it every second day for the first week unless there are signs of exacerbation. In strong early cases without septic or other complications one early cases without septic or other complications one tablet may be added after the first week on the intermediate days and increase gradually till after three or four weeks, the patient is taking 3 tablets daily for six days a week. It may, however, be a considerable time before a weaker or more advanced case reaches this dosage. The hæmoglobin should be tested every week to begin with and iron (and if necessary liver extract) continued in all cases with a percentage below 80 or 90. A fall below 70 per cent or the intercurrence of increased reaction calls for temporary suspension of diasone or diminution of the dose. When a dose of 3 tablets a day for six days a week has been reached it is well to suspend treatment for one week every it is well to suspend treatment for one week every month. Apparently when full dosage is suddenly resumed after this temporary stoppage the blood concentration rises to a higher level for a time. In patients who have improved and are free from signs of anæmia and reaction the dose may be gradually raised to 6 tablets daily six days a week for three weeks a month—this being regarded as the maximum average dose, though it may be increased or diminished according to the body-weight of the patient.

LENGTH OF TREATMENT

In any case, treatment should be continued at least until repeated bacterioscopic examinations have given negative results over a period of six months to two years, varying directly with the advance of the disease at the beginning of treatment, and with the length of treatment required to produce the first negative bacterioscopic results.

SUMMARY

The sulphones have been found of definite benefit in the severe or lepromatous type of leprosy, clearing up complications, causing a slow but steady diminution of the bacilli, and in some cases bringing about arrest of the disease.

Tin in Typhoid Fever: Report of 50 Cases of Typhoid Fever Treated with Aldestan, an Organic Tin Compound

By N. D. PATEL

(Abstracted from the *Indian Physician*, Vol. 5, September 1946, p. 209, as abstracted in the *Bullclin of Hygiene*, Vol. 22, March 1947, p. 178)

The clinical label typhoid fever was used to include typhoid and paratyphoid fever A and B. Fifty unselected serial patients suffering from one or other unselected serial patients suffering from the cuttors would be a sufficient to the cuttors would be a sufficient to the cuttors. of these conditions admitted to the author's wards were treated with a proprietary preparation of tin named Aldestan in tablet form, each tablet containing the equivalent of 0.012 gramme of metallic tin. The dosage was 0.06 gramme per day by mouth for 12 days in adults, and for children under 10 years, half a tablet for each year of age daily. Potassium iodide, 25 grains daily in adults, and proportionately less for children, was given 'to enhance the therapeutic action of the drug', a diaphoretic mixture with salicylates was given thrice daily, and the usual dietetic, symptomatic and nursing treatment was applied. Fifty serial cases admitted to other wards during the same period and treated in the orthodox fashion were employed as controls. In the treated series, the number of deaths was 4 as compared with 12 in the controls, the excess of deaths in the latter being due almost entirely to toxemia, and in recovered cases the subjective improvement in the toxemia was 'very marked in all cases' of the treated series. The average length of the febrile period was not appreciably reduced and in cases which responded favourably, counting from the first day of Aldestan treatment, the average duration of pyrexia was 10 days. Excluding the 4 fatal cases, a favourable response was claimed in 32 of the treated cases but in 5 of these relapses occurred; incomplete response was observed in 5 cases; and no response was produced in 8. In the absence of specific therapy the conclusion is drawn that 'tin appears to be the drug of choice in the treatment of typhoid-paratyphoid fevers'. The drug was safe and well tolerated, the only serious toxic manifestations observed being leucopenia in 2 instances, and mental confusion in another two.

A Case of Hiccup

By R. C. NAIRN

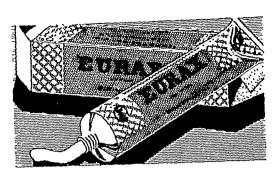
(Abstracted from the Lancet, i, 14th June, 1947, p. 829)

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Correspondence

COCCIDIOSIS IN THE ARAKANS

Sir,—I read with interest the communication of Capt. Mukherji on 'The incidence of coccidiosis in the Arakans' in your December 1947 issue.

I came across several (about a dozen) instances of isospora infection during routine stool examinations in isospora infection during routine stool examinations in army laboratories (1943-46). Most of these were 'routines' from the hospital patients (unselected), two detected during 'Food handler's carrier's tests', one a patient admitted for 'Sprue syndrome'.

The majority were British but 3 or 4 were South Indians (Madrassi). It is interesting to note that most of the units concerned passed through 'Assam-Arakan areas (east of Brahmaputra)'. Unfortunately I have not kept any special record of the cases. Experiences of other nathologists will be of interest.

of other pathologists will be of interest.

A. SEN GUPTA.

JADAYPUR COLLEGE, 23rd April, 1948.

Any Questions

TREATMENT FOR FILARIASIS

Sir.—I shall be grateful if you will inform me about (i) the latest method of treatment for filariasis, and (ii) the name of an institution or institutions where such treatment is being given.

Yours truly, CHANDRAN.

GUDIATHAM (MADRAS).

[Treatment for filarial infection has hitherto been only symptomatic, as no specific substance, having lethal action on the adult filariæ or the embryos, was known. Rest of the affected part, attention to septic foci, surgical interference if necessary, use of simple vaccines (streptococcal and staphylococcal), administration of sulpha drugs, penicillin, etc., are the usual measures adopted. In some cases administration usual measures adopted. In some cases administration of arsenical preparations give good results. Very recently, American workers have used antimony preparations, trivalent and pentavalent, in large doses on patients showing microfilariæ in peripheral blood and claim to have made the blood microfilaria-free in course of time. Experimental treatment in similar lines are also being done at the Carmichael Hospital for Tropical Diseases, Calcutta, for the in-door patients only, while at the out-patients' clinic symptomatic treatment is given.—N. V. B.l

Service Notes

APPOINTMENTS AND TRANSFERS

In exercise of the powers conferred by clause (a) of sub-section (1) of section 3 of the Indian Medical Council Act, 1933 (XXVII of 1933), the Central Government is pleased to nominate Lieutenant-Colonel M. G. Bhandari, c.e., Surgeon-General with the Government of Bombay, to be a member of the Medical Council of India, from Bombay, with effect from the 8th April, 1948, vice Lieutenant-Colonel Jelal M. Shah, o.e., resigned.

Dr. K. C. K. E. Raja was appointed Deputy Director-General of Health Services, with effect from the 15th

August, 1947.

Mr. C. P. Agrawala, Additional Officer, was appointed in post of Deputy Assistant Director-Stores), Medical Store Depot, Raipur, from 13th April, 1946 to 13th September, 1946.

He was again appointed to officiate as Deputy Assistant Director-General (Medical Stores), Medical Store Depot, Raipur, with effect from 1st April, 1947.

LEAVE

Major E. L. Jones, Additional Deputy Director-General of Health Services, is granted leave on average pay for 2 months and 15 days with effect from the 1st April, 1948. His services will be terminated on the expiry of this leave.

RETIREMENT

Lieutenant-Colonel S. D. Gupta. Dated 15th February, 1948.

RELINQUISHMENT

Lieutenant-Colonel Amir Chand relinquished charge of the temporary post of Senior Administrative Medical Officer, Refugee Camp, Kurukshetra, on the 31st March, 1948 (afternoon).

RESIGNATION

The undermentioned officer is permitted to resign his Commission and to retain the honorary rank of Lieutenant-Colonel:—

ARMY IN INDIA RESERVE OF OFFICERS-CATEGORY-8 (Medical)

Captain (Honorary Lieutenant-Colonel) Gurbuksh Singh. Dated 8th May, 1948.

Publishers' Notice

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The

Indian Medical Gazette TRAGEDY NUMBER

A TRAGEDY the like of which had not shocked the world for 1,915 years enveloped India in gloom on the 30th January, 1948! Medical men are affected like other men. Medical India mourns.

The Indian Medical Gazette is bringing out a special number in two months' time. Contributions are invited on all subjects which mitigate suffering and thus would have found favour with the Mahatma.

The following subjects are suggested :-

1. Psychology of lesser men, men and supermen.

Social fabric, population pressure, poverty and misery.

Crime and punishment. The irresistible impulse.

Juvenile and senile delinquencies.

Capital punishment.

Hanging as capital punishment. Shooting as capital punishment.

Preservation of human dignity and liquidation of unwanted life.

Euthanasia. 10.

Operation for abortion. Killing and callousness.

Humane slaughter. 13.

14.

Food, gluttony and fasting. Stimulating drugs, their use and abuse.

Beverages, intemperance and prohibition.

The present system of education in general and medical education in particular.

18. Span of human life.

Contributions are not limited to medical men only: Veterinary sur-geons, missionaries, lawyers, educa-tionists and social workers are also contributing.

Original Articles

THE TREATMENT OF POLYCYTHEMIA BY ARTIFICIAL INFECTION WITH ANCYLOSTOMA DUODENALE

By L. C. BRUMPT (Paris) and B. J. GUJAR (Bombay)

The treatment of polycythemia by the standard classical methods is found to be rather disappointing. In the year 1939 we thought with Professor Duvoir of Paris of a new method of treatment by artificially infecting the patient with Ancylostoma duodenale. As regards the older methods of treatment there is much that can be said against them.

The treatment by phenylhydrazine is contraindicated in hypertension, cardiac, renal and
liver diseases, and in elderly patients. As
Vaquez and Moquin have pointed out, it is
necessary to use freshly prepared products,
which makes this therapy still more difficult.
There is no proper standardization of this drug
and the effective dose cannot be prescribed
without any trials and a long period of cautious
adjustments. One patient treated by Dr. Duvoir
and J. Bernard with phenylhydrazine presented
a rapid fall in the R.B.C. count, followed by
hæmolytic icterus which endangered his life. We
have also to bear in mind the possibility of the
toxic after effects of the drug, which accumulates
in the body.

Irradiation of the spleen or of the pylorus is rarely very effective and the beneficial results, if any, are only temporary. The x-ray therapy of the epiphyses, the tele x-ray therapy, the injections of radio-active substances like thorium X, when efficient, may affect not only the red cell series but also the whole of the hæmopoietic system. The resulting leucopenia, which cannot be corrected by any means, compels us to stop the further course of the treatment.

In an attempt to find out a less harmful therapeutic measure which would have a most progressive and a more prolonged action, we considered the possibility of bringing about a state of anæmia in the patient by an artificial parasitization by the hookworms. As we are aware of the serious nature of the hookworm infection, which is one of the ætiological factors of the 'tropical anæmia' and the so-called 'anæmia of the miners', the attempt of inoculating these nematodes into a patient suffering from Vaquez's disease would appear at first thought as not only very bold but definitely dangerous. Careful investigations however have shown that these anæmias are serious only in the cases of patients harbouring more than 1,000 parasites and especially if there are associated multiple nutritional deficiencies. As in the artificially

infected cases auto-infection can be avoided, the number of parasites will necessarily decrease as time passes on. And if need arises we possess a sufficient number of potent anthelmintics to destroy the hookworms.

The first case treated by us on the above lines was that of a woman suffering from Vaquez's disease with such complications as pulmonary infarction and cerebral thrombosis with hemi-January, 1939, she was 300 larvæ of hookworms. plegia. On 4th inoculated with Within three months' time the R.B.C. count fell from 7,000,000 to 3,500,000. As the risk of anæmia was borne in mind, she was given, perhaps wrongly, some anthelmintic and injections of liver extract. The number of the R.B.C.s increased in three months to 6,000,000 and reached in one year the initial count of 7,000,000. Subsequently two more inoculations were carried on; in February 1940 with 200 larvæ and in February 1942 with 300 larvæ and the R.B.C. count was finally perfectly normal.

Encouraged by these findings, we applied this method of treatment to all the cases of polycythemia that came under our medical care. Considering the rarity of this disease it is rather significant that up to 1945 we could treat 25 cases with good results. In all the above cases the regularity and the uniformity of therapeutic action of the ancylostomes enabled us to claim that this method is efficient, harmless and that it can be properly controlled.

The artificial hookworm disease

The technique of carrying out the artificial infection is as follows:—

A sample of the stool of a person infected with Ancylostoma duodenale is required; a small amount of the stool is mixed with animal carbon in an earthen vessel which is placed in a glass bowl containing water. At the temperature of 25°C, the eggs mature and develop into rhabditiform larvæ. These larvæ after a series of moultings become strongyloides and later infective strongyloides. The latter after ten days gather in the clean water of the glass bowl. Before proceeding further the larvæ should be accurately counted. According to the degree of polycythemia and the patient's body weight, we use from 300 to 600 larvæ. In order to inoculate the patient the larvæ are collected on a blotting paper soaked in water, which is applied directly over the skin and covered with cotton-wool, to avoid drying. The evolution of the artificial infection is easy to follow. The blotting paper, which is left on for one hour, allows the parasites to enter under the skin. Ten minutes after the beginning of the penetration into the skin by the larvæ, the patient experiences pruritus. The blotting paper, when removed one hour later, reveals a patch of urticaria. The next day at the site of the inoculation elements of maculopapular rash are seen on an erythematous background. They are soft and tender to pressure and have hair roots in their centres.

The pain and itching increase during the night time. After a couple of days the rash disappears, except when it has been scratched, in which case it develops into prurigo and gets pigmented. We did not come across the polymorphic, vesicular, pustular or impetiginous cruptions characteristic of the ground-itch, where secondary infections also are so common. As the artificial infection is brought about under the best conditions of hygiene, the usual complications in the naturally occurring hookworm disease are thus avoided.

We tried to analyse the symptoms arising during the course of the migration of the larvæ through the respiratory tract. The third day after the inoculation the larvæ reach the lungs via the pulmonary veins.* Their size of $560 \,\mu$ does not allow them to enter the capillary system. Therefore they penetrate the alveoli and ascend along the bronchioles. But in no case did we observe clinical or radiological pulmonary signs. It seems therefore very unlikely that the hookworm, like the roundworm, is an ætiological factor of the Loeffler's syndrome. We also observe that the eosinophilia does not. appear at this stage, which further strengthens our view. The pulmonary catarrh is present but is due to the penetration of the larvæ in the trachea and larynx.

One patient (treated by Dr. Laederich) who was inoculated with 700 larvæ presented on the third day retrosternal pain, laryngeal itching, cough and hoarseness of voice. This hoarseness, however, we observed later, persisted in some cases for as long a period as three weeks. On the fifth day he complained of dysphagia which might have been due to the presence of larvæ in æsophagus. The parasites reach duodenum on the eighth day. One of our patients felt at that period some epigastric pain. It is generally on the 30th day when the adult worms have reached the maximum size of 15 mm. that this pain is more marked. This epigastric pain is either of a burning, twisting or pricking type, increased by pressure and relieved momentarily by the intake of food. Anorexia is rare and often there is an increase in the which may even be Diarrhea is the second important symptom of duodenitis. Stools may be frequent, four to ten per day, and watery, but unlike the dysenteric stools, contain fæcal matter. Sometimes the diarrhœa is absent and is replaced by constipation. These intestinal disturbances might be very serious for the first two months but mostly improve later on. They are the only drawbacks of this method, but can be checked by the use of opium preparations.

The duodenitis due to worms was described clinically and anatomically a long time back. The natives of the Antilia Islands are fully aware that abdominal pains precede and accompany the serious anæmia so common there. In the

same way occurrence of hunger pain, boulimia, geophagia, perversion of taste called 'pica' by the American Indians are also well known. In a patient who was x-rayed by Dr. Porcher after a barium meal, D3 (the third part of the duodenum) was found to be dilated and immobile. The mucous membrane was ædematous and the mucosal folds were exaggerated. These findings extended to the jejunal loop. Let us point out that this duodenitis is very much alike to one due to Strongyloides stercoralis. These facts illuminate our conception of the morbid anatomy of ancylostomiasis and duodenitis which is a much discussed chapter in gastro-enterology.

Its influence on hamopoiesis

The favourable action of the hookworm infection in polycythemia can be appreciated clinically as well as hæmatologically. Until the end of the first month the R.B.C. count remains about the same-7,000,000 to 10,000,000 according to the cases. Then it starts falling down steadily and progressively, reaching the figure of 4,000,000 at the end of the third months. At that time there is generally a small increase and the total number of R.B.C. reaches about 5,000,000 or a little more at the end of the sixth month. Leucocytes show an opposite tendency, the leucocytic count reaches, at the end of the third month, the figure of 40 to 60 thousand and then decreases slowly. Leucocytosis is restricted only to the granular series. The eosinophiles in particular rise up to 75 per cent of the total W.B.C. count at the end of the third month and come down to about 25 per cent after six months and 15 per cent after a year. Very often the clinical improvement is felt before any hæmatological change is noted; this might be due perhaps to the diminution of the total blood volume of the body. The coloration of the skin and the mucosa, the drowsiness, the headache, the ocular troubles and the dizziness disappear and the improvement that results lasts for months and years. Relapse of polycythemia may occur, but can be cured by fresh inoculation of 300 to 400 larvæ.

During the period of treatment we have never noticed any complications of the disease. Though two of our patients died-one of cardiac failure and the other of senile dementia-in neither of the cases presumably the parasites were responsible for deterioration of the patient's condition. In most of the cases we noticed a fall in the blood pressure, diastolic as well as systolic. Whether it is due to the diminution of the blood volume or of the blood viscosity, or to the relief of the renal congestion, we cannot definitely say. Dr. Laederich's patient before starting the treatment showed albuminuria, microscopic hæmaturia, blood casts, blood urea reaching to 0.69 gm. and the blood pressure of 200/130 mm. A few months after the introduction of the parasites, urine was found to be normal, blood urea was 0.27 gm. and the blood pressure came down to 160/100 mm.

The mechanism of the fall in the R.B.C. count

The mechanism of hookworm anæmia is not quite clear. Gradual loss of blood due to its ingestion by the parasites was supposed to be the cause of the anæmia; but it has never been proved that the hookworm was hæmatophagic in man. No blood was ever found in the stomach of the parasites on the post mortem. It has been suggested that the hookworm feeds itself on the mucosa. The trauma causes Melæna, however, e cases. The very the minute hæmorrhages. is never observed in these cases. reliable and sensitive micro-chemical test for the detection of the blood in the stools are positive only intermittently. Even if the hæmatophagic ætiology is accepted, its favourable action in polycythemia is not understand-

Some authors are inclined to believe that the hookworm has a traumatic effect which favours the growth of the bacteria. The primary site of infection in that case would be the duodenal mucosa, the presence of which has never been confirmed. An argument in favour of the infectious origin of the anæmia is the presence of total leucocytosis with relative increase in the polymorphs. We can state that in our patients followed for months, together in our wards, we have never come across any signs of infection.

The toxic theory is more interesting. The hookworm secretes, just as the leech does, a substance like hirudin. Loeb and Smith extracted from the salivary glands of the hookworm an anticoagulant toxin which may have a deleterious action on the hæmopoietic process. It is very strange then that some cases of polycythemia in hookworm carriers have been reported. These apparently parodoxical com-binations might be explained. The toxin in smaller doses may be responsible for the disease. On the other hand we have also noted that in certain cases the number of the erythroblasts in the bone marrow picture decreases to become normal indicating that the toxin had in higher doses a depressant effect on the bone marrow. The eosinophilia probably is also a phenomenon. If we realize that in some patients we found 20 to 40 thousand eosinophiles per cubic mm., we might wonder if the eosinophiles do not exert a peculiar pharmacodynamic action. Vaguely speaking eosinophilia is supposed to be a favourable finding. The creation of eosino-philia may then in itself be a therapeutic measure.

The cause of the hookworm anæmia then seems more probably due to a deficiency in absorption or in the secretion by the duodenal mucosa of the anti-anæmic factor. The mucous membrane which is either destroyed or functionally impaired by the presence of the hookworm

cannot secrete or perhaps absorb the anti-anemic factor and thus anemia results. The reverse of it may also be true; because, it is interesting to note that polycythemia, according to certain workers, is due to the hypersecretion of the anti-anemic factor.

The pathogenesis of polycythemia and that of the hookworm anemia then can be explained on the same principles but working in opposite directions. In that case the treatment with artificial infection by hookworms might perhaps be specific for polycythemia, to which up to now only symptomatic treatment was applied.

Advantages of this treatment

If compared to the former lines of treatment polycythemia the 'ancylostomotherapy' offers numerous advantages. First of all its simplicity; it does not involve any complicated technique. The blood counts can be done at longer intervals; the fall in the R.B.C. count is slow, regular and never dangerous. It is essentially an ambulatory treatment and does not require hospitalization of the patient nor cessation of his daily activities. Moreover, the results of the treatment are lasting, as the duration of the untreated hookworm infection in the human body is for five or six years. It does not seem improbable now that the action of the hookworms on the duodenal mucosa may give a lasting cure. In all cases the hookworm infection stops by itself. And it is very easy to check it at any stage, if needed, which is not so with the treatment by thorium injections for instance.

This method can be applied for all the stages of primary as well as of secondary polycythemia. The majority of our patients had already been treated by various other methods without success. It is perhaps possible to combine this method with any of the older ones. Thus the protein-free diet advised for polycythemia is more effective if the patient has also received an artificial hookworm infection. Maybe that the parasites make the patient more sensitive to this treatment.

There is perhaps only one contra-indication to the application of this method. It is the case of tuberculosis of the spleen with polycythemia which cannot be thus treated. It occurs however very rarely and is diagnosed still more rarely.

Drawbacks of this treatment

The main drawback of this method lies in the cases of severe degrees of polycythemia which would need a much larger number of parasites, which give rise to a severe and painful duodenitis and diarrhæa. But the effects are transitory and can be relieved by the use of opium preparations. We want to point out that in the majority of the cases the patients were grateful to us to be relieved of their symptoms of polycythemia. Some of them however had a tendency to blame the hookworm for all their troubles. It is advisable in the case of a neurotic patient not

to let him know the details of the treatment. The main difficulty is also in preventing the spread of the disease by the hookworm carrier. It is largely dependent on the atmospheric temperature. In temperate zones the larvæ die rapidly when exposed to the exterior. In other countries construction of good latrines and the use of shoes offers adequate protection.

Conclusion

The 'ancylostomotherapy' is based on a biological principle.

In the 25 cases treated by us the results were

uniformly good and satisfying.

Our experience with this method enables us to state that this is a very simple method, harmless to the patient, that the R.B.C. fall is slow and lasting.

The physician is able to adjust and control the method according to the seriousness of the disease and can put an end to it, if so needed.

Harmless to the patient the 'ancylostomotherapy' deserves to be applied in cases of polycythemia whenever not specifically contraindicated.

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A STUDY IN FOLIC ACID

By P. V. KARAMCHANDANI, M.B., B.S., F.R.C.P. (Edin.)

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Whenever a new drug is discovered it raises expectations which subsequently fall short of original levels. Folic acid is no exception. We are still in the stage of contradictions. Any accurate record which attempts to resolve these should be welcomed. Present paper is such an

In folic acid we have a specific form of therapy and a compound, molecular structure of which is known. This is an advantage. In nature it exists in several forms depending upon the glutamic acid groups in the molecule. Thus we have the synthetic form containing one glutamic acid group, the 'fermentation acid' form containing three groups and a third one with seven groups. The first is a free form while the last two are conjugates and the advantage of the former over the latter is obvious, because in diseased conditions of body, release of folic acid from the conjugate forms in food can be hampered.

Following questions arise here: (1) Is there any other factor which liberates free folic acid in normal individuals? (2) Can the conjugates be prepared which will be pure, and therefore effective? (3) Do any naturally occurring conjugate inhibitors exist? If so, do they vitiate purity by contamination? (4) Can folic acid be produced in free form as a product of bacterial synthesis in the human intestine?

We have had no complete answers to the

above.

The next question is whether action of folic acid is anti-anæmic or erythrocyte maturing. This also remains to be settled. However, certain facts have emerged giving partial answers and the author proposes to discuss these in this paper.

Finally can it be said at present whether definite and specific indications of folic acid

therapy exist. If so, what are these?

The number of patients treated by the author with free and conjugate forms of folic acid is small but because the results are clear he has ventured to publish them. The views of the author in respect of sprue syndrome in India have been published already elsewhere. The old conception that in India sprue affects foreigners with normal nutrition has been disputed in the above paper. While giving a talk on sprue syndrome at the Twenty-third All-India Medical Conference at Madura, Mr. H. A. Orlove of Lederle Laboratories placed at the author's disposal supplies of free folic acid. Cases of sprue syndrome were treated with this. Notes on these are briefly appended.

First case.—Doctor B who was suffering from chronic diarrhœa for over a year had treated herself with bismuth, kaolin, etc., without relief. When glazed tongue, dyspepsia, asthenia and anæmia got superadded, she got her stools and blood examined and made a diagnosis of sprue. She took liver extract and vitamin B complex parenterally in large doses but without relief to diarrhœa and asthenia. She came under the care of the author in January 1947, and was treated with free folic acid orally as follows:

Hæmogram. 9-1-1947. RBC 4.06 mil., WBC 7,400, 72P, MCV 122, MCH 33γγ. MCHC 26 per cent, Hgb. 95 per cent (13 gm.).
11-1-1947. 18 mg. free folic acid per day orally.
First time improvement noticed. Diarrich 2015 18 per 2015 2015 2015

11-1-1947. 18-1-1947.

rhœa controlled. 28-1-1947.

Improvement maintained. 29-1-1947. Folic acid inadvertently stopped by the

31-1-1947. 1-2-1947,

patient.
First relapse; diarrhoea restarted.
Folic acid 18 mg. a day orally.
Attack of flue with shivering and fever
Folic acid stopped. 3-2-1947.

6-2-1947. Deterioration accentuated. 18 mg. of folic acid recommended.

	•
13-2-1947. 20-2-1947.	Diarrhœa controlled, felt better. Improvement maintained. Folic acid reduced to 12 mg. per day.
	Free folic acid not available, therefore
	area tone and not available, dieterore
	stopped.
7-4-1947.	Given conjugate folic acid 2 c.c. by injec-
	tion once a week.
10-5-1947.	Went to the hills. Weekly injections
100 1011.	continued.
25-5-1947.	Second relapse: diarrhœa started.
31_5:1047	Returned from the hills and put on free
01-0-1941.	reconnect from the unit and but on free
	4 11

She is taking it till this day (11th July, 1947). She has gained weight and is feeling quite well doing her strenuous doctor's work. Her diet has been rice, dhal, vegetables, curd, milk, tea and fruits.

folic acid 10 mg. a day orally.

Second case.—Mr. J., a forest officer, felt gradually run down with diarrhea and dyspepsia for some months. Ascribing his diarrhea to diet he cut this down and his condition deteriorated, digestion got upset, diarrhea became worse, and asthenia set in. He was put on folic acid as follows:—

22-1-1947. Free folic acid 18 mg. a day.

Blood report—RBC 3.91 mil., Hgb. 78 per cent, CI 1, WBC 7,500, P 70, L 25, M 4 and E 1 per cent.

Much interested Free folic acid 6 mg.

5-2-1947. Much improved. Free folic acid 6 mg. a day.

8-2-1947. Blood report—RBC 4.14 mil., Hgb. 80 per cent.

12-2-1947. Folic acid stopped as none was available.

He has not relapsed and is keeping quite fit.

Third case.—Sri S. P., suffering for several years from chronic diarrhea, dyspepsia, anæmia, asthenia and glossitis became very ill and was treated as follows:

13-2-1947. Folic acid 18 mg. per day. 28-2-1947. Folic acid 6 mg. per day.

4-3-1947.	Total RBC 3.4 mil., WBC 10,400, Hgb. 15.5, MCV 132, MCH 4977, MCHC 34 per cent.
7 0 1047	Th.1. 1

7-6-1947. Relapsed.

8-6-1947. Folic acid 15 mg. by injection daily up to 18-6-1947.

19-6-1947. Folic acid 6 mg. per day orally. Diarrhœa controlled and feels well.

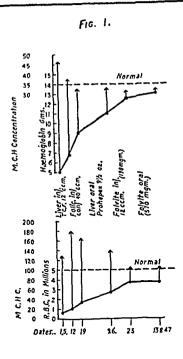
In addition to the above, two more cases apparently presenting symptoms of sprue were unsuccessfully treated with folic acid. One of these was a medical student whose stools had been repeatedly examined for *E. histolytica*. When folic acid failed the author had the stools examined immediately after passing, and *E. histolytica* cysts were found. Anti-amebic treatment (blunderbuss) relieved the patient. The other case was of a similar nature treated with folic acid by a medical practitioner on his own. When the author saw her he diagnosed the condition amebiasis and confirmed the diagnosis by stool examination. Anti-amebic treatment was successful.

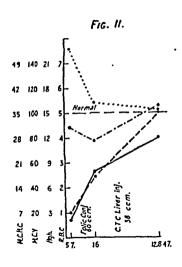
Since free folic acid became scarce the author had to look round in India for conjugate folic acid. Messrs. W. T. Surén & Co., of Bombay, had sent 100 sample tubes of the same in an injectable form of 2 c.c. each. These were tried by the author but he suggested better concentration, since the results with their NBD 46, 2 c.c. ampoules were not satisfactory. They kindly sent 5 c.c. ampoules, concentration being same. This preparation contained 1.25 mg. of folic acid per ampoule composed of 4 casei factor, fermentation factor containing 2 glutamyl radicals.

Following further cases are recorded:

First case.—Arunachalam (macrocytic hyperchromic anæmia; megaloblastic marrow reaction; sprue syndrome).

	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
1-5-1947	0.9	5.1	122 γγ	46.0	0.5	Sternal puncture— Megaloblasts 8 per cent. Normoblasts 22 per cent.
12-5-1947	1.0	6.8	180 γγ	38.0	0.64	Total TCF liver i.m. 12 c.cm. from 3-5 to 12-5. Blood transfusion 300 cm.
19-5-1947	1.7	9.35	166 yy	33.3	22.0	Folic acid conjugate i.m. 40 c.cm. (5 c.cm. daily) 12-5 to 19-5.
9-6-1947	2.7	11.0	133 γγ	30.5	1.8	Prohepex orally 2 teaspoons. B.D. total received 9½ oz. with vitamin B complex. Sternal puncture— Megaloblasts 5 per cent. Normoblasts 25 per cent.
23-6-1947	3.8	12.6	105 γγ	31.0	0.76	Folvite 2 c.cm., i.e. 15 mg. parenterally, total 12 c.cm. (180 mg.) between 10-6 to 22-6.
. 13-8-1947	3.7	12.75	103 γγ	30.0	2.7	Folvite 30 mg. daily (from 24-6 to 15-7) orally.





Second case .- Aravayee. Admitted on 30th June, 1947.

	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks		
3-7-1947	2.68	8	122 γγ	26.0	4.2	Sternal puncture— Megaloblasts Normoblasts		7 per cent. 18 per cent.

4-7-1947 Folic acid conjugate 5 c.c. daily for 12 days.

te reacti	ion was a	s follo	ws :
		Pe	er cent
••	• •		4.2
• •	••		56
			6.5
••			8.2
	••		11.0
	••		14.0
••	••		15.2
••	• •		17.0

			Per cent
12-7-1947	••		18.2
13-7-1947		••	19.2
14-7-1947		••	20.4

General improvement was striking but unfortunately the patient went away and no final check-up with hæmogram and sternal puncture could be done.

Third case.—Paravati (pregnant 30th week).

Macrocytic hyperchromic anæmia with megaloblastic marrow reaction with sprue syndrome.

	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
5-7-1947	0.65	3.0	154 γγ	30.0	6.0	Sternal puncture— Megaloblasts 14 per cent. Normoblasts 16 per cent.
16-7-1947	2.6	7.6	107 γγ	27.0	21.2	Folic acid conjugate 5 c.c. daily parenterally 5-7-47 to 16-7-47 = 12 days.

Sternal puncture— Megaloblasts Normoblasts

5 per cent.

21 per cent.

172		THE	E INDIAN	MEDICA	AL GAZET	ΓΕ [April, 1948
_	yte respons	e was as fol	Per cent		11-7-1947 12-7-1947	Per cent
6-7-1947 7-7-1947 8-7-1947 9-7-1947 10-7-1947	••		8.6 10.0 12.4 14.8 16.6		13-7-1947 14-7-1947 15-7-1947 16-7-1947	
23.87 con	fined of a	dead fœtus.				
	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
12-8-1947	4.0	15.0	100 γγ	37.0	16.6	Up to 12.8 liver extract crude Cipla 38 c.c. parenterally, 8 c.c. stat and 4 c.c. alternate day.
Graphic repre	esentation is	given in figu	re II.			
Fourth c	ase.—Madu	ıra Muthu.	Admitted	on 15th	July, 1947.	
	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
15-7-1947	1.18	5.5	144 γγ	33.0	1.8	
23-7-1947	2.8	9.8	100 γγ	30.4	17.5	Folvite 15 mg. daily parenterally from 18-7-47 to 23-7-47 (total 90 mg.).
Reticulo	cyte reactio	on was as f	ollows :— Per cen	t	20-7-1947 21-7-1947	Per cent 10.5 12.0
18-7-1947 19-7-1947		••	7.2 8.0		22-7-1947 23-7-1947	14.0
	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
2-8-1947	3.7	11.0	103 γγ	30.0	20.2	Folvite 30 mg. daily for 3 days up to 26-7-1947 and 20 mg. daily up to 2-8-1947.
24-8-1947	3.3	12.2	149 γγ	38.0	14.0	Folic acid conjugate 18 c.cm. and TCF liver 16 c.cm. parenterally
4-9-1947	4.1	13.4	154 γγ	44.0	••	up to 22-8-1947. Folvite 20 mg. daily orally up to 4-9-1947.

Graphic representation is given in figure III.

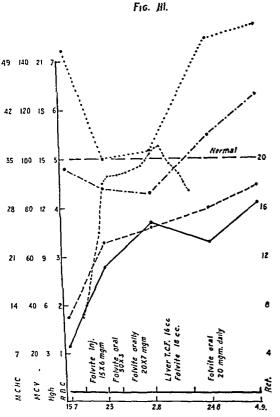
Fifth case.—Umar Shariff. Admitted on 15th July, 1947.

2 9	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks .
15-7-1947	1.8	9.0	150 γγ	33.3	2.3	Bone marrow— Megaloblast Normoblasts 25 per cent. 27 folio acid con-
23-7-1947	2.8	11.0	104 yy	36.0	8.0	iugate 5 c.c. daily (30 c.cm.).
1-8-1947	3.2	12.6	105 γγ	31.0	13.4	(15 mg.) daily by injection.
27-8-1947	2.3	9.0	130 γγ	30.4	12.8	Conjugate folic acid 5 c.c. i.m. up to 10-8-47 (6 injections). Edema of legs and feet but can help himself and walk.

Six more injections of folic acid conjugate 5 c.cm. Œdema increased.

Sixth case.—Amni Bai. Admitted on 12th June, 1947.

	RBC (in mil.)	Hgb. (in gm.)	MCV	MCHC, per cent	Reticulo- cyte, per cent	Remarks
27-6-1947	2.06	7.5	166 yy	53.5	4.4	12-6-47 to 27-6-47 (Cipla) liver injections 30 c.c.
17-7-1947	1.82	9.0	153 γγ	32.0	7.5	Liver (Cipla) up to 17-7-47 62 c.c.
1-8-1947	2.7	10.4	110 γγ	8.08	165	Folic acid conjugate 5 c.c. daily 4 injections, 29-7-47 to 1-8-47.



Since no more folic acid was available she was given Lilly's liver extract 8 c.cm. on 5th August, 1947, and then every alternate day 4 c.cm. up to 9th September, 1947.

	Reticulocyte	response		
	•	•	P	er cent
29-7-1947	• •			13.4
30-7-1947	• •	• •		16.5
31-7-1947	• •	• •		17.2
1-8-1947	• •	• •		17.2
2-8-1947 3-8-1947	• •	• •	• •	17.2
5-8-1947	• •	• •	• •	14.8
6-8-1947	• •	• •	• •	14.6
7-8-1947	••	• •	• •	14.8
8-8-1947	• •	• •	• •	15.2
9-8-1947	• •	••	• •	15.2
11-8-1947	••	••	• •	14.0
11 0-1011			• •	14.0
	Conclus	sions		

1. Folvite is a reliable therapeutic agent for the alleviation of clinical features of sprue syndrome; diarrhœa was completely controlled, rapid improvement in appetite and general sense of well-being restored. But for bringing about cure, prolonged treatment is considered necessary.

2. Folvite proved superior to both folic acid conjugate or crude liver in restoring hæmatological picture to nearly normal limits. The bone marrow was not preponderably megaloblastic in reaction before starting treatment, still response was good. This finding at first sight appears to be at variance with that of workers abroad but when it is remembered that anæmias in South India are nutritional this application assumes an additional importance.

3. Reticulocyte response was quite satisfactory. Therefore folvite when administered parenterally to critically ill patients can be relied upon to produce rapid initial response. This is by far its best critical use, almost substituting blood transfusion, temporarily though it is. It is just like a recruiting officer rapidly enlisting raw soldiers (i.e. RBC) into the service (i.e. circulation) in crisis of war. Who matures these raw soldiers into seasoned ones like the depôt officer we don't know—maybe the liver.

4. On this analogy its use in agranulocytosis is equally tenable.

5. Pure folic acid (folvite) can be given successfully to patients who are sensitive to liver. This is another important application.

Conjugate folic acid also produced very good reticulocyte response. And when it is remembered that each ampoule of 5 c.c. contained just 1.5 mg. folic acid as compared to 15 mg. in 1 c.c. of folvite, the results appear still more encouraging. Perhaps it is better to call this preparation 'natural folic acid'. Since it is derived from natural sources having yeast and liver as base, the encouraging results may possibly be due to this. This preparation is promising but the only practical aspect for preference of folvite by patients was its less local reaction after injection. But then the injection is not more painful than crude liver extracts and there is great scope for its use. I have to mention that three patients developed ædema after a course of 12 injections of conjugate folic acid. But improvement was noticed after T.C.F. ferilex and prohepex. I suggest a course of pronutrin in such cases. The explanation is Brisk hæmopoieses resulting from simple. potent potions result in fall of plasma proteins to very low levels. This is because when protein within cell, specially liver cell is low, plasma protein is utilized towards hæmoglobin formation. This of course happens in cases where malnutrition consequent on absence of proteins from food has taken place and depleted the protein reserves of body. Once depletion occurs in plasma protein, anasarca is the natural consequence. Thus the answer is to build up protein reserves of body by administration of pronutrin, prohepex or other meat proteins of high biological value.

Many thanks are due to Dr. V. Iravatham, D.L.Sc., D.T.M., the pathologist, for his great help and to Major A. Devasagayam, L.M.P., L.T.M., the Honorary Assistant Medical Officer. Gratitude is also due to Mr. Orlove of Lederle Laboratories for generous samples of folvite and Dr. A. G. Brock, D.Sc., of Messrs. W. T. Surén & Co., Bombay, for abundant experimental samples of natural folic acid.

PLASMA, CONCENTRATION OF ASCOR-BIC ACID IN HEALTH AND PATHOL-OGICAL CONDITIONS

By INDER JIT BABBAR

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In a previous communication (Ahmad et al., 1945) some interesting observations were made on the urinary excretion of ascorbic acid in health and disease. Now the study of plasma level of ascorbic acid has been made. References in the literature on the plasma concentration of ascorbic acid in health and disease are few but none of them tries to ascertain relationship of plasma ascorbic acid to any disease factors or blood pictures. Richeri and Litter (1939) con-

cluded from their study that ascorbic acid in blood varies from 1.23 to 2.47 mg. per 100 c.c. Infections cause an increased demand for ascorbic acid but does not lead to actual hypovitaminosis C. Concepcion and Paulino (1939) regarded 0.7 mg. per cent as the border line limit for normal individuals, and plasma level below 0.7 mg. per cent was, according to them, indicative of insufficiency or pre-scorbutic condition. Farmer (1940) found that in infants scurvy may occur with blood ascorbic acid as high as 0.4 mg. per cent while in adults the level may be 0.1 mg. per cent or even less.

In this paper a study has been made of the plasma concentration of ascorbic acid in Indian subjects in apparently healthy and some pathological conditions and an attempt to correlate some disease factors or blood pictures. The results on about 110 subjects are summarized.

Ascorbic acid was determined by the method of Farmer and Abt (1935). Urea, hæmoglobin, RBC count, red blood sedimentation rate were determined by the usual clinical methods.

It will be seen that while in apparently healthy persons plasma has an average of 0.797 mg. per cent ascorbic acid in pathological conditions as uræmia, smallpox, syphilis, non-tuberculosis and pulmonary tuberculosis, ascorbic acid has an average of 0.695 mg. per cent, 0.613 mg. per cent, 0.49 mg. per cent, 0.427 mg. per cent and 0.447 mg. per cent respectively. All these figures are much below the normal range taken as 0.7 mg. per cent. It shows that there is an increased demand of ascorbic acid in pathological conditions. It is also noticed that average sedimentation rate is more in tuberculosis

Pathological conditions	Number of cases	Factors examined	Maximum value	Minimum value	Average value
Healthy subjects	10	Hæmoglobin per cent RBC Plasma ascorbic acid	5,840,000 0.92	60 5,210,000 0.69	73.6 5,438,000 0.797
Uræmia	12	mg./100 c.c. Hæmoglobin per cent RBC Blood urea mg./100 c.c. Plasma ascorbic acid	5,600,000 180 0.89	54 3,000,000 50 0.47	71.3 3,900,000 103 0.695
Pleurisy	15	mg./100 c.c. Hæmoglobin per cent RBC Plasma ascorbic acid	6,200,000 1.18	48 3,000,000 0.35	60.2 4,643,600 0.49
Smallpox	10	mg./100 c.c. Plasma ascorbic acid mg./100 c.c.	0.90	0.42	0.613
Non-tuberculous but showing general tuber- culosis symptoms.	27	Hæmoglobin per cent RBC Sedimentation rate (1 hour). Plasma ascorbic acid	6,780,000 110 1.24	3,100,000 6 0.3	58.8 4,089,111 30.3 0.427
Pulmonary tuberculosis	30	mg./100 c.c. Hæmoglobin per cent RBC Sedimentation rate (1 hour). Plasma ascorbic acid mg./100 c.c.	74 5,930,000 85 0.84	3,260,000 4 0.132	58.8 . 4,084,000 37.4 0.437

than in non-tuberculous conditions. This confirms the observations of other authors. In tuberculosis and non-tuberculosis the plasma ascorbic acid, hæmoglobin and RBC are all much lower than in other pathological conditions. This work involving the therapeutic effect of ascorbic acid in tuberculosis is being continued in New Delhi Tuberculosis Clinic.

My thanks are due to Dr. B. K. Sikand, New Delhi Tuberculosis Clinic, Dr. Sher Singh of Irwin Hospital, New Delhi, and Dr. Ghaneshyam Singh of Infectious Diseases Hospital, Delhi, for their kind help in this investigation.

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DIABETES MELLITUS—ITS MANIFEST-ATIONS IN THE ORAL CAVITY

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DIABETES is a metabolic disease associated with insufficient insulin production in the pancreas, or increased demands for this substance. Early recognition of this disease is unfortunately not always easy. It has been observed that 12 per cent of the diabetic people present no clinical symptoms whatsoever. It is generally a disease of middle adult life, though diabetes in younger people is not uncommon. The initial symptoms are very often so gradual and diverse that their true significance and nature are not realized until the complications are more pronounced. Laboratory findings are a sure test. Glycosuria suggests a diagnosis of diabetes and a repeated elevated blood sugar is diagnostic.

Learned workers in this line, e.g. Magitot, Zilz, Ziskin, etc., stressed that the symptoms of this disease are most often found in the oral cavity; but in my opinion exact periodontal involvement is rather difficult to determine because the occurrence of diabetes and periodontal diseases are on the same age range. For a careful study juvenile diabetic patients have to be selected and observations noted. The above workers also found that the high incidence of periodontal disease in adult diabetes is perhaps due to the diabetic state.

Symptoms.—The gums are often deep red in colour, hypertrophied and very dry. Proliferating masses of granulation tissue protruding from under the gingival margin, general extensive suppuration of the marginal gum and the intradental papillæ are some of the common observations. In fact, this extensive suppuration helps in the differential diagnosis between diabetes periodontitis and the functional one. Quick and extensive alveolar atrophy and the loosening of the teeth are due to the removal of calcium salts from the alveolar process favoured by the reduced alkaline reserve. Some of the activities of the vitamins especially vitamin C are depressed in diabetic individuals. Frequent root abscesses should suggest the possibility of the disease. In my opinion routine laboratory examination in all periodontal disease is helpful.

Teeth.—Pain and sensitiveness of the teeth on percussion are common findings. A sudden onset of caries or its active progression is often associated with diabetes. This may be due to decreased flow of saliva, and according to some workers (Kirk, Simmon, etc.), there is an increased fermentable content in the saliva of the diabetic which affords a good medium for acid production. Pulpitis or odontalgia sometimes occurs in a diabetic. This is due to a diabetic arteritis of the dental pulp, which may result in the death of the pulp. The tooth becomes dark and sensitive and gradually the pain is severe.

Case history no. 1.—W. R., age 46, an Anglo-Indian railway engine driver. He was first referred to me on 18th February, 1947, for the treatment of recurrent parietal root abscesses accompanying periodontitis. Following conditions were noted:—

General.—General weakness with gradual loss of weight.

Gums.—Deep red in colour, slightly hypertrophied and extremely dry. Generalized suppuration of the marginal gums. Extensive calcareous deposits, and the subgingival accretions extremely hard.

Tongue.—Dryness and burning sensation. The fissures of the tongue were pronounced and there were appearance of a few xanthomatous nodules.

Teeth.—Marked erosion on the labial aspect of most of the single-rooted teeth on the upper jaw.

The patient did not give any history of diabetes even after suggestion, so the routine dental treatment was undertaken. On 10th January, 1948, the patient consulted me again. He had 4 of his upper eroded and abcessed teeth extracted on 12th December, 1947, in one sitting under local anæsthesia by an out-station dentist and he had been using since then a gum paint containing phenol. This was also prescribed by the dentist who attended him. The following record was made:—

Gums.—Marginal necrosis of the tissues about extracted sockets, which were being traumatized by the corresponding lower teeth during chewing. Abundant calcareous deposits (rather unusual within such a short time) with marked alveolar resorption. Extensive suppuration of the gum margins, which were painful.

Teeth.—Painful to touch.

Tongue.—Furrowed.

General.—For about a year and a half the patient felt general weakness, but his appetite increased considerably, and unfortunately because of this his doctors advised him not to worry as hunger, he said, was a sign of good health. On further questioning it was revealed that the patient was suffering from polyphagia, polydipsia and polyuria. He also gave history of frequent boils, etc., on the body. The case was sent for proper laboratory examinations' which confirmed my suspicion of diabetes.

Case history no. 2.-M. S., a young Jewish girl of 18 years of a tailoring establishment, consulted me in March 1947. She complained that in spite of her best care she very quickly accumulated calcareous deposits. Her tongue was always very dry, and I found it somewhat hyperæmic. Upper right central, lateral and canine teeth showed marked symptoms of periodontal disease which I could not satisfactorily explain by local factors. My suggestion of possible diabetes was laughed at, she even refused to have her urine analysed. So only routine treatment was given to her. She consulted me again in January this year with the same complaint, i.e. abundant deposit of hard calcareous deposits around the teeth. Gums of those 3 teeth had receded considerably with marked generalized suppuration of the marginal gums and interdental papillæ, and loosening of the teeth. The gums were painful. Further questioning was not very satisfactory, she admitted being often thirsty but not hungry; she felt general weakness but did not urinate often. In fact, this conflicting report of the patient led me to suspect fusospirochætal infection even in the absence of its most important sign, i.e. ulcerations. The patient was ultimately persuaded to undergo laboratory examinations both for the gum, smear and urine. The former was negative for fusospirochætes and the latter positive for diabetes. It may be interesting here to note that I had 2 similar juvenile diabetic cases belonging to Jewish race. It is for the diabetic expert to say whether the disease has

a predilection for Jewish race. In conclusion, I will like to mention three important facts which are to be remembered by the dentists while handling a diabetic patient.

1. Elevation in blood sugar to be prevented: The nervous and emotional excitement causes an elevated sugar level, due to increase in adrenaline output. A calm and confident attitude is of utmost importance. The dental operations are to be performed 2 to 3 hours after breakfast and the administration of insulin.

- Anæsthesia: Local anæsthetic without adrenaline is to be used, as the latter increases the blood sugar level. For the same reason general anæsthesia is to be avoided. A noted worker in this line suggests nitrous oxide after the patient had ½ to ½ of his usual morning insulin. The operation is done on a fasting stomach 3 hours after insulin. Ten minutes after the patient gets the remainder of the insulin.
- 3. Post-operative complications: This can be done by being as atraumatic as possible. Adequate amount of vitamin C may be given prior to dental operations.

(The incidence of caries is known to be not greater in diabetics than in non-diabetics. The infection, however, is capable of making the disease worse. Jews are known to be prone to diabetes.—Editor, I.M.G.)

ENDEMIC ENTERIC FEVER IN A VILLAGE

By S. B. DATTA, L.M.P., L.T.M. Barkola, Cachar

TYPHOID is a problem for diagnosis, treatment and prevention in rural practice without laboratory facilities. I would quote the letter that was addressed by me to the Director of Pasteur Institute where some serums were sent for Widal test. It started all of a sudden in an epidemic form and at the onset it became a puzzle due to its very mild onset.

'There is a peculiar distribution of the disease. It is located and confined to one family in village, gradually affecting almost all the members of the family. The disease has an insidious onset, almost typhoid like, with headache and chill. It runs a course of almost typhoid fever. All ages and sexes are affected.

'I understand that the disease has spread all over this sub-division in this area. It is spreading in an epidemic form.

Is it typhoid? There are some "walking cases" (serum of no. 2) who have a continued temperature for last 12 days but no toxæmia, no abdominal symptoms, or any other definite sign. The temperature is continuing at 100 to 101 degrees. Bowel symptoms—diarrhea is present in some cases but right iliac gurgling is absent (present in one case only), rash absent in all cases. Spleen not enlarged, bronchitis is present in majority of cases. The only diagnosis that can fit in is influenza, but why it is limited to one family and does not spread like influenza? Can it be typhus, but it is not known in this area. If it is typhus group, please communicate the result by wire for preventive measures'.

By walking cases I mean that the patients had only slight temperature and could do all household (indoor) duties. The clinical picture of two families of one village is tabulated. None of the signs or symptoms were severe except that in some cases the temperature continued for days, Deaths were uncommon,

TABLE

Age and sex	Bronchitis	Diarrhœa	Toxæmia	Flatulence	Rash	Spleen	Result of laboratory examination and remarks
12, M. 14, F. 5, M. 4, M. 8, F. 7, M. 14, M.	+ + +	+	-	+			B. typhosum 1 in 100. B. typhosum 1 in 125.
8, F. 7, M. 14, M. 19, M. * 12, M. * 22, F. * 20, M. * 5½, F.	+++	+++	- - - - -		-		B. typhosum 1 in 300. B. typhosum 1 in 110.

2nd family (more blood could not be sent for want of material for collecting blood).

*The disease started as an epidemic last April and still continuing in a sporadic form. It is becoming a problem to distinguish this pest from other diseases even kala-azar (in early stage).

THE PREVENTION OF HÆMOLYTIC DISEASE OF THE NEWBORN BY NON-SPECIFIC IMMUNIZATION: EXPERIENCE OF A CASE

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In collaboration with

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In a previous communication (Ranganathan, 1947) one of us (K. S. R.) reported on a typical case of iso-immunization of a mother against Rh factor. Each of her last three babies had succumbed during the neonatal period of jaundice or anæmia, the first child alone being unaffected. From the obstetric history, the Rh status of the parents and of the surviving child and from the presence in the mother's serum of Rh antibodies specific against the child's red cells, it was predicted that all future babies will probably be affected by hæmolytic disease. The mother came under observation in August 1947 with a history of having missed the periods from the 23rd March, 1947. Thus an opportunity presented itself for a study of the trends in the development and behaviour of the maternal antibodies during the pre- and post-natal periods and for trying out measures that may prevent or delay the formation of the antibodies. The patient was under the observation of the junior author from the 23rd November, 1947.

There are at present no measures that will positively prevent iso-immunization of the mother through the placenta. Wiener (1945) has suggested counter-immunization of the mother by a more potent antigen such as typhoid or pertussis vaccine early in the course of the pregnancy. The rationale of the method is that if two antigens of unequal potency are injected into an individual, the antigenicity of

the weaker antigen may be suppressed by the stronger one. In this case it was expected that the vaccine, being a more potent antigen, might suppress or delay the formation of Rh antibodies. So far as we are aware, no report of success or failure of this method has yet appeared in the literature.

More recently, Kariher (1947) has claimed success in two out of three cases in which an attempt was made to prevent hæmolytic disease by repeated injections to the mother of ethylene disulfonate (Allergosil Brand). The Council on Pharmacy and Chemistry of the American Medical Association (1946) has reported on this preparation. The dilution of the chemical is 1 preparation. The dilution of the chemical is 1 in 10⁻¹⁶ in triple distilled water. It means that each 2 c.c. injection (the dosage used) contains 0.000000000000 mg. of ethylene disulfonate. 'Some idea of the extreme dilution can be gained from the computation that 1 mg. of the so-called ethylene disulfonate would require more than 250 million gallons of water' which is enough, in the words of the commentator, 'to supply a city of 250,000 at per capita consumption of 100 gallons for 10 days!' Council has declared ethylene disulfonate not acceptable for inclusion in New and Non-official Remedies. It was therefore decided, despite the favourable report by Kariher, to try Wiener's method of counter-immunization with typhoid vaccine. For convenience, prophylactic T.A.B. vaccine (manufactured at the King Institute, Guindy, Madras) containing 1,000 millions of E. typhosa and 500 millions each of B. paratyphosum A and B per c.c. was used.

Materials and methods

The mother's blood was tested for Rh antibodies at approximately monthly intervals from the 20th to the 31st week of pregnancy. The presence of both agglutinating and conglutinating antibodies was looked for. The injections of

T.A.B. vaccine were begun in the 31st week commencing with 0.25 c.c. and increasing by 0.25 c.c. until 1.0 c.c. was reached. The injections were given subcutaneously at weekly intervals. At each of the visits following the first injection 5 c.c. of blood were withdrawn from the vein and allowed to clot in a dry sterile tube. With the serum so obtained qualitative tests for Rh sensitization were continued using at least three different Rh positive group O cells. If the tests were positive, the titre of the antibodies was estimated. In the absence of bovine albumin normal group AB serum was used for diluting the serum and for suspending Rh positive cells. From the 35th week the antityphoid titre of the mother's serum was tested by the Widal test. The results of the tests are shown in the table.

technique (1942) but not when it was diluted 1:2 with saline solution.

Condition of the baby.—The baby looked apparently healthy. There were no congenital malformations. Vernix caseosa was slight, normal in colour. There was no jaundice or cedema at birth. Neither was there enlargement of the liver or spleen. The infant's cry was normal.

The hæmoglobin content of the cord blood was 38 per cent (Sahli). The blood belonged to group B—same as that of the mother—and was Rh positive with a commercial anti-Rho serum (Lederle). Van den Bergh test was biphasic. Examination of the cord blood smear showed numerous nucleated red cells—at least three or four per oil-immersion field—and 560 of them were counted against 100 leucocytes.

. TABLE
Tests for Rh sensitization

	Week of pregnancy	Dose of vaccine, c.c.	RH SENSITIZATION TESTS		ANTI-RH TITRE			
Date of blood test			Chown's test	Agglu- tination test	Conglu- tination test	Agglutinin	Conglutinin	Anti-typhoid titre
5th Aug 13th Aug 11th Oct 25th Oct 1st Nov 8th Nov 15th Nov 22nd Nov 29th Nov 6th Dec	20 25 29 31 32 33 34 35 36 37	0.25 0.5 0.75 1.0 1.0 1.0	 + + +	· - + + +				

+ indicates a positive test.

The health of the mother continued to be good throughout the pregnancy except for a small painless vaginal bleeding in the third month which yielded to treatment. A skiagram of the fœtus was taken in the 37th week of pregnancy for evidence of erythroblastosis fœtalis but none of the radiological signs described by Javert

(1942) was seen.

The mother was admitted into the Irwin Hospital, New Delhi, on the 16th December, 1947 (39th week) and was delivered of a live female baby at 5.30 p.m. on the following day. The liquor amnii was normal and pale yellow in colour. The cord was clamped immediately after the baby was born and the baby separated. A sample of the cord blood was collected for investigation. The baby was well formed and weighed 5 pounds. The placenta was apparently healthy and weighed 23 ounces. The ratio of the weight of the placenta to that of the baby was 1:3.5. A few pieces of the placenta were preserved for histological examination. sample of the colostrum was tested for Rh antibodies. Neat colostrum clumped Rh positive cells when it was tested by Witebsky et al.

- indicates a negative test.

There were macrocytosis and some polychromasia. A differential leucocyte count gave 36 per cent polymorphonuclears, 63 per cent lymphocytes and one per cent mononuclear leucocytes.

The placenta was found normal on histological examination. Post-natal samples of maternal serum submitted by mail for estimation of Rh antibodies was found, to our utter disappointment, damaged in transit.

Progress of the baby.—18th December, 1947. The baby was never fed on colostrum or breast milk. It took small feeds of glucose water on the first day. A slight jaundice was noticed on the second morning (within 16 hours) which became marked in the afternoon. A blood transfusion was decided upon, but attempts to needle a vein were unsuccessful.

19th December, 1947. Jaundice increased. Baby cried normally. Took feeds of glucose water. Passed urine and motion normally. Thirty c.c. of Rh negative group O blood from the mother's brother was given by the tibial medullary route. There was no reaction.

20th December, 1947. Further increase in the jaundice. Liver and spleen not felt. Baby was given an ounce of half strength Nestle's milk which it took well. A second transfusion of blood from the same donor was given through the other tibia by one of us (S. S.) but only 25 c.c. could be transfused.

21st December, 1947. Jaundice and the general condition much the same. Baby did not take feed well. No transfusion was given. 22nd December, 1947. Jaundice almost the

same. Baby took feeds better. A blood transfusion was given through the sagittal sinus. The breathing stopped during the transfusion and artificial respiration was started. The baby began breathing again and recovered completely.

23rd December, 1947. General condition not Jaundice persisting. No sign of improved. improvement. Baby not taking feeds well. A blood transfusion (40 c.c.) was repeated through the fontanelle. The respiration stopped again and all efforts to resuscitate the baby were of no avail. The heart continued to beat for 5 minutes after the breathing stopped.

Discussion

We are concerned here mainly with the outcome of the preventive treatment rather than with that of the treatment of the affected baby. There is conclusive clinical and hæmatological evidence to show that the baby suffered from icterus gravis. It is also clear that antepartum immunization with typhoid vaccine had apparently no effect in preventing its onset. But before the utility of such treatment can be assessed in the present case, it would be well to examine whether immunization was commenced early enough, and whether the dosage and duration of immunization were adequate. Although preventive treatment was not started quite early in the pregnancy, we believe that it was instituted sufficiently early because there was, at that time, no demonstrable evidence of the presence of Rh antibodies in the mother's blood. This indicates that there were no antibodies due to the 'carry-over' phenomenon from the previous pregnancy or resulting from the present one. Further, transplacental immunization is believed to occur generally in the last trimester when the placenta is well developed. So it was our endeavour to time the preventive treatment in such a way that there may be an effective 'competition of antigens'. Another reason was the impracticability of giving continued treatment from early in the pregnancy to full term.

As regards the dosage and adequacy of treatment the method described was specially adopted with a view to avoiding any severe reactions in the mother. The fact that the dose of 1 c.c. of T.A.B. vaccine is generally successful in the prophylaxis of enteric fever was taken to indicate an adequate degree of immunization. The maximum dose was repeated in order that a high antibody level may be maintained. The anti-typhoid titre of the mother's blood rose to

It will be seen from the table that the first test for Rh antibodies was made in the 20th week of pregnancy when none was demonstrable. It may be mentioned that the saline antibody (agglutinin) titre was 32 when the test was made four months after the birth of the last child. negative test in the 20th week indicates that the antibody level had gradually declined and finally became undemonstrable in spite of the early pregnancy. It will also be seen that no antibodies were demonstrable in the 31st week when the injections of T.A.B. vaccine were begun. It is interesting to note that Rh antibodies were not demonstrable until the 35th week, i.e. until 25 days previous to the birth of the baby. Another striking feature is the low titre of the antibodies, 1:1 for agglutinating antibody and 1:2 for conglutinating antibody. The titre remained the same until the vaccine injection was stopped 11 days prior to confinement. In spite of the late development of antibodies and their low concentration the infant suffered from typical icterus gravis.

It has been observed by several workers that the antibody level bears no relation to the severity of the disease in the infant. But recent refinements in technique have shown that there is generally a correlation between the maternal antibody level, and specially the time of appearance of the antibodies and the severity of the disease in the infant. Howard et al. (1947) has observed that mothers of infants with subclinical hemolytic disease show significant rising titres of Rh agglutinins or blocking antibodies beginning about the 10th week antepartum, while mothers of infants with frank hæmolytic disease show high titres early in the pregnancy. More recently, Primrose et al. (1947) have described graphic records for the prognosis of the infant from the antibody curves. It will be seen that the behaviour of the antibodies in the present case does not conform to any of these patterns. Whether the delay in the formation of the Rh antibodies and their presence in minimal amounts in the mother's blood is the result of anti-typhoid immunization is not known. As we have no knowledge of the severity of the disease in the previous babies, it is also not possible to say if there has been any reduction in the severity in the present baby. Obviously, further work will be needed before definite conclusions can be drawn.

The efficacy of any preventive method must be judged not only by its capacity to prevent the disease altogether, but also by its ability to reduce the severity of the disease and making it amenable to proper treatment. In this connection the failure of treatment to save the life of the baby must not be allowed to prejudice one against the utility of the preventive measure. It is therefore necessary to analyse the findings in order to assess the probable cause of death of the baby and to bring out any lessons

that may be learned from it. From the clinical features the case appears to be one of uncomplicated icterus gravis. During the days that the baby was alive a careful watch was maintained for signs, suggestive of the dreaded complication, kernicterus, but they were entirely absent. The general condition of the infant, apart from the severe jaundice and anæmia, did not show any marked deterioration but continued to be more or less stationary. The transfusions given through the bone marrow were well tolerated and were not followed by any reactions. But the first transfusion through the sagittal sinus was followed by respiratory failure necessitating artificial respiration, which was successful in resuscitating the baby. The recovery was complete and the general condition was the same as before the transfusion. The sequence of events was identical at the second transfusion by the same route except that the respiratory failure was permanent. The conclusion that the transfusion had something to do with the immediate The exact cause of death seems irresistible. mechanism is not known as no autopsy was possible. But it has demonstrated that the cranial route is by no means a safe one.

The difficulty of giving any form of intravenous treatment to the newborn is well known. It is all the greater if the infant is premature or is undersized as in the present instance. Further, cases of erythroblastosis fætalis have been so rarely recognized here that opportunities for treating affected babies by blood transfusion have been few. It is natural that attempts to transfuse the baby were unsuccessful and that alternative routes for transfusion, via the bone marrow and sagittal sinus, had to be resorted. It may, in retrospect, be asked whether any other routes might have been utilized for transfusion. Blood transfusion to the newborn can be given through the umbilical cord as Mayes (1944, 1946) described. It is relatively easy but the decision to transfuse must be made well in advance and everything required for it should be kept ready at the time of labour, and the transfusion given as soon as the baby is born. The only disadvantage is that some babies that might escape being affected by hæmolytic disease on account of the heterozygosity of the father may receive an unnecessary transfusion and be exposed to the risk of overloading of the circulation and polycythæmia. As a last resort, when all other attempts fail, the blood may also be given intraperitoneally. Favourable reports have been recorded after such a procedure. The baby is, however, apt to develop some degree of 'peritoneal shock' and will require stimulant treatment.

It might also be questioned whether the baby would have had a better chance of survival had it been delivered by Cæsarean section. If the operation were performed before term, prematurity of the infant would have added to the difficulty. There is also no guarantee that transfusion would not have been needed. If

performed at term, blood transfusion would still have been required and no useful purpose achieved. It is questionable whether the increased risk to the mother is justified.

Mention may here be made of a symptom described by the mother, which may have some significance in relation to the time of feetal affection. After one of the blood tests the mother was informed that the results were negative. She was apparently not convinced and replied 'wait and see'. Asked what she meant by it, she stated that in each of the three previous pregnancies the fœtal movements generally became sluggish about the beginning of the seventh month and that the change had been noticed in the present pregnancy about a week earlier.

Summary

- 1. A case of apparent failure of non-specific immunization by typhoid vaccine to prevent hæmolytic disease of the newborn is reported. It is possible that the preventive treatment somewhat mitigated the severity of the disease. The method deserves further trial.
- 2. Noteworthy features are the late development of Rh antibodies and their low concentration in maternal blood and in the colostrum. The baby was nevertheless affected by erythroblastosis fœtalis.
- 3. The possible danger of the cranial route for blood transfusion is stressed.

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conducting the labour.

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A SIMPLE METHOD OF CUTTING SERIAL SECTIONS OF TICKS*

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nnd

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Introduction

Considerable difficulty leading almost to despondency is often experienced in cutting serial sections of ticks for histological and other related studies. Reagents such as diaphenol employed for softening the chitinous structures (Sapre, 1939) invariably damaged the soft parts of ticks. Cowdry and Ham (1932), in their studies on the endogenous stages of Theileria parva in the tick Rhipicephalus appendiculatus, avoided cutting the chitin by removing the chitinous covering with an iridectomy knife prior to fixation. Shortt (1936) in his studies on the life-cycle of Babesia canis in R. sanguineus followed the above technique with success. Sen (1941) described a process of cutting sections of minute chitinous objects by means of Peterfi's methyl-benzoate method, the dehydration being done by solvax as recommended by Eltringham (1933). For cutting sections of ticks Cowdry (1943) recommends the adoption of Slifer-King technique for grasshopper eggs after fixation with Carnoy-Lebrun fluid containing equal parts of chloroform, absolute alcohol and acetic acid saturated with mercuric chloride. This technique, however, required the trimming of the paraffin block in such a manner that a portion of the viscera was exposed and then immersed in water containing 4 per cent phenol. Sections were cut quickly after the material had been softened by the above process.

The authors with different objects in view-Ray with the object of studying the life-cycle of Theileria annulata in H. agyptium, and Bhattacharya to study the embryology of the entomophagus insect, Hunterellus hookeri, parasitizing the nymphal stage of this tick—made several unsuccessful trials with various methods so far described of dealing with chitinous objects (Mukerji, 1937; Murray, 1937; Imms, 1939). One important point that always had to be borne in mind was that at no stage preparatory to section cutting the anatomical disposition of

the tick was to be disturbed.

The method described here is based upon Peterfi's methyl-benzoate and Cowdry's celloidin double embedding methods and is almost similar to what is outlined for cutting minute chitinous objects by Sen (1941). The modifications introduced are indicated below (see procedure).

It may also be added here that by this method the authors were successful in cutting serial

sections of the house-fly.

In the beginning the material was embedded in parassin (56° to 58°C.) and it was often noticed that although there was no difficulty in getting the ribbon the tissue often separated from the surrounding embedding medium and soon curled or folded upon itself. The defect however was completely removed when paraffin was replaced by tissuemat.

Procedure

Material.-Hyalomma ægyptium.

(1) Fixation.—Fix in Bouin-Duboseq and Brasil's† fluid for 12 to 18 hours. While in the fixative remove appendages with a sharp instrument. In case of engorged larva, nymph and adult within half an hour of fixation make a few punctures in the body with a glass needle. This is to ensure the penetration of the fixative which is further augmented by exhausting the air by means of a vacuum pump. Unfed larva, nymph and adult need not be punctured but air must be exhausted as above.

(2) Washing.-Wash in 70 per cent alcohol

for 12 to 18 hours.

N.B.—Ticks, if desired, can be stored in 70 per cent alcohol without any fear of extrahardening of the chitinous parts. Flat adults of H. agyptium fixed in Bouin-Duboscq and Brasil's fluid and preserved in 70 per cent alcohol were sectioned without any difficulty by the method described here after a lapse of seven years and three months.

(3) Dehydration and clearing.—Transfer to solvax for 48 hours with two or three changes.

(4) Transfer to methyl-benzoate with one or two changes. While in methyl-benzoate engorged adult females and engorged nymphs may be cut into two pieces with a sharp safety-razor blade. This process was found to help the subsequent penetration of embedding media.

(5) Apply vacuum pump. It was found to

help matters greatly.

(6) Embedding.—Transfer to 2 per cent solution of celloidin in methyl-benzoate for 48 hours with two changes. Sen (1941) used 1 per cent solution while Cowdry (1943) recommends 1 per cent and 3 per cent solutions of methylbenzoate celloidin.

(7) Wash in benzol for 48 hours with two changes. Apply vacuum pump if it has not

already been done at stage 5.

(8) Transfer to equal parts of benzol and paraffin or tissuemat from 1 to 2 hours at bath temperature. Sen (1941) treats his material in benzol-paraffin for 15 to 30 minutes at 37°C. Cowdry (1943) in double embedding method avoids passing through benzol-paraffin mixture.

^{*}Read before the Section of Zoology and Ento-mology of the Indian Science Congress Association at its 34th Session held at Delhi in January 1947.

[†] Sat. picric acid in 90 per cent alcohol ... Sat. HgC₁₂ in dist, water ... 2 parts 3 Formalin 1 part . . Gl. acetic acid 2 parts

(9) Embed in tissuemat (56° to 58°C.) or paraffin (56° to 58°C.) as follows:-

Unfed larva .. 1 hour.

Unfed nymph .. 2 hours.

Unfed adult .. 3 to 5 hours.

Engorged larva .. 2 hours.

Engorged nymph 5 hours.

Engorged adult .. 4 to 6 hours.

N.B.—Robinson and Davidson (1913) in their method of cutting sections of the soft tick Argas persicus emphasize the point that embedding in paraffin bath should not be carried out for a longer period than is absolutely necessary but, unfortunately, they do not mention the requisite time. Cowdry (1943) recommends embedding in paraffin (40°C.) for about 12 to 24 hours. To cut a large number of larvæ or unfed nymph at the same time the method adopted by Shortt (1936) was employed. He, however, fixed larvæ partially while the authors started at stage 2. A large number of larvæ was introduced into a rectangular pocket made in a previously fixed piece of liver. The mouth of the pocket was closed with a drop or two of albumen over which 70 per cent alcohol was run to coagulate the plug of albumen. The remaining procedure was the same as for tick.

- (10) Sectioning.—Cambridge-Rocker tome was used for cutting sections from 6μ to 10μ tick. To get satisfactory results one must have a set of three or more razors with perfect sharp edges. The ribbon can be stored away in some dustproof place, to be arranged on slides the next day or the day after without any apprehension of desiccation of the tissue and its accompanying bad results.
- (11) Stretching.—Arrange sections on a clean slide and then flood the slide with albuminated water (30 drops of Mayer's albumen + 100 c.c. of distilled water). Hold the slide over the flame of a spirit lamp. As soon as the ribbons start stretching remove the slide from the flame and give quick rotatory motions to the slide. This will ensure the hot layer of albumen-water to flow uniformly under the sections and stretch them properly. This process may be repeated if necessary. Finally, the water is drained off and the slide is left overnight in an incubator at 37°C. for complete drying.
- (12) Preparations of sections for staining.— Remove tissuemat or paraffin from the sections in tulol for 2 to 5 minutes. Immerse the slide for 1 or 2 minutes in 1 per cent solution of celloidin prepared in equal parts of ether and absolute alcohol. Take out the slide, partially dry it in the air and then pass it through the down grades of alcohol to water for staining. Sections treated in this manner could stand hydrolysis in weak hydrochloric acid bath at 60°C.

In the beginning the authors started from xylol, absolute alcohol and then came to 1 per

cent solution of celloidin in ether-alcohol but this invariably gave disappointing results as pretty often it was noticed that immersion into absolute alcohol after xylol either dislodged many sections from the slide or disturbed their chitinous contour by throwing them in various directions. But with the method described above no such accidents were encountered.

Summary

A detailed method of cutting serial sections of tick is described. Material is fixed in Bouin-Duboscq and Brasil's fluid, dehydrated in solvax, cleared in methyl-benzoate, embedded in methylbenzoate-celloidin and tissuemat or paraffin. Different embedding times for unfed and engorged larva, nymph and adult of Hyalomma agyptium are indicated. Serial sections of the house-fly and highly keratinized skin of sheep were also successfully cut by this method.

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INFANTILE DIAR-TREATMENT OF RHŒA WITH PHTHALYLSULPHA-THIAZOLE (M. & B.)

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Introductory

Below is recorded a study of 13 cases of infantile diarrhœa treated with phthalylsulphathiazole (M. & B.). The dosage of the drug varied according to age and severity of the disease. Only phthalylsulphathiazole tablets (each 0.5 g.) were given and recourse to other drugs was taken when the former failed to control the disease. Diet consisted of whey for the first 24 hours, half-diluted milk afterwards, and boiled water ad lib. In extremely dehydrated cases subcutaneous injection of normal saline (4 to 6 ounces) was given and repeated as required.

The case reports are tabulated below :---

Table
Case reports

Num- ber	Name, age, sex, nationality	Symptoms	Stool report	Number of tablets in 24 hours	Symptoms controlled in hours
1	G., 3, H.M	Frequent stools about 6 per day, and vomiting about 3 per day—10 days. Dehydration +. Pulse 100.	Microscopic—no abnormality. Culture—B. coli.	∄ q.i.d.	24
2	М. Р., З. Н.М	stools with blood and mucus about 10 per day—10 days; fever—3 days. Dehydration	Bacilli in large number and red cells. Culture—not done.	1 t.d <i>s.</i>	24
3	D., 1, H.M	++. Pulse 120. Frequent stools 10 to 12, and vomiting 4 to 6 per day— 10 days. Dehydration ++.	A few pus cells. Culture— B. coli.	₫ q.i.d.	24
4	B. D., 3, H.M	day, and fever—3 days. Temperature 100°F. Pulse	Pus cells. Culture—B. coli	1 t.d.s.	24
5	C. B., 6/12, H.F.	124. Green stools about 10 per day—1 month, and vomiting 2 to 3 per day—1 day. Dehydration ++. Pulse 120.	Pus cells. Culture—not done	½ t.d.s.	48
6	J., 2, M.M		Culture—B. coli	½ q.i.d. (for 96 hours).	Failed. Cured with other drugs.
7	C., 1, M.F	T	Culture—B. coli	½ q.i.d.	96
8	S., 3, H.F	77	••	1 t.d.s.	96
9	G., 2, Ch.M		Culture—B. coli	∄ q.i.d.	24
10	O. P., 1½, H.M.	Stools 8 to 10 per day, and fever—1 month. Temperature 100°F. Pulse 114. Liver 1 inch, firm.	Culture—B. coli	∄ q.i.d.	48
11	S. C., 1, H.M		Culture—B. coli	½ q.i.d. (for 96 hours).	Failed. Relieved with other drugs.
12	K., 8/12, H.F	Green stools 6 to 8 per day, and vomiting 2 to 4 per day—1 month. Dehydration	i ·	½ t.d.s.	L.A.M.A. 24
13	M. S., 6/12, M.M.	+. Frequent stools about 30 per day, and vomiting 3 to 4 per day—1 month. Dehydration +++. Temperature subnormal.		t.d.s. (for 96 hours).	Failed. Patient died.

Summary

Out of 13 cases 10 (76.9 per cent) were cured, for two recourse to other drugs had to be taken and one died. Eight were cured in 24 to 48 hours and the other two in 96 hours. The drug was found to be very effective. In no case was any clinical toxicosis observed.

I take this opportunity for thanking Messrs. May and Baker (India), Ltd. for supplying me with phthalyl-sulphathiazole tablets for this work; also Dr. G. N. Vyas, M.D., M.R.C.P., P.M.S., Superintendent, Thomason Hospital, Agra, Dr. Sohan Lall Agarwal, M.B., B.S., and the nursing staff of the children ward.

A Mirror of Hospital Practice

A CASE OF MYELOMENINGOCOELE

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Manika Ghose, an average Bengali female child of 5 months, had a lump at the lower part of her back since birth. The lump was reddish in colour and it was said that there had been a watery discharge from a small orifice in this swelling for about a month after her birth. The swelling had been rapidly increasing.

On examination, she was an emaciated child and the lump on the back was about the size of a billiard ball. The general coloration of the swelling was dusky red but the central area was pinkish blue. It occupied the lower dorsal and upper lumbar regions.

There were two areas of ulceration on the surface of the swelling. The swelling was very tense and only very slightly reducible on pressure. Pressure on the swelling increased the tension of the anterior fontanelle.

On transilluminating the swelling, a clear view was obtained and no nervous structure could be discovered.

Calcaneovalgus of slight degree of the left foot was the only physical deformity.

Skiagrams revealed non-union of the laminæ of the 8th to 12th dorsal vertebræ. The outline of the swelling was clearly seen. There was fusion of the necks of 7th and 8th ribs on the right side. The 11th and 12th ribs were absent on both sides (figures 1 and 2, plate IX).

As the tension inside the swelling was very high and increasing rapidly and as it was apprehended that, if not tackled quickly, the swelling might rupture, the decision about the operation had to be made quickly. In spite therefore of the not too healthy skin and the two superficial ulcerations, I made up my mind to operate and set about cleaning the skin with 'Cetavlon', a soapy solution made by the I.C.I. After cleaning and drying a lot of penicillinsulfamezathine powder was sprinkled on the This was done on 4 occasions and surface skin. 24 hours before the operation intermittent penicillin injections were started, 10,000 units every 3 hours with the idea that there would be an adequate concentration of penicillin in the blood at the time of the operation and immediately afterwards.

The question of anæsthesia was carefully considered and it was decided to use local anæsthesia only. Administration of general anæsthesia in the prone position in such a small child without causing increase of cerebro-spinal fluid pressure would have been a very difficult performance. In retrospect, I think that the decision to use local anæsthesia was a sound one. Half per cent novocain with adrenalin, altogether about 30 c.c., was used.

Operation.—The patient was in the prone position with the head end low. To begin with about 40 c.c. of cerebro-spinal fluid were aspirated through a clear area in the skin. This reduced the pressure in the swelling and two converging incisions were made, one on either side of the swelling so as to include an elliptical area of skin which was gradually dissected off the subjacent dura. At the top of the swelling, the two were inseparably adherent and the dura had to be opened at this point letting out few ounces of cerebro-spinal fluid. The redundant skin which contained the two ulcers was then excised. The skin on either side was also dissected out from the sac for a considerable distance. A mass of nervous structure, a flattened piece about 1 inch square together with a few nerve strands, was found lying inside the sac, near its fundus. This was unexpected. Great care was taken to dissect this out without injuring any nervous filament and at the top of the fundus the adherent dura was cut out and replaced inside the canal together with the main mass. All this time hæmorrhage had been minimal. The excess of the sac was then trimmed and the dural margins united with fine silk sutures.

Replacement of the nervous mass revealed a hole about 2 inches long and 11 inches broad. Two vertical incisions were made in the sacrospinal aponeurosis, i.e. in the posterior layer of the lumbo-dorsal fascia about 1 inch from the margins of the central hole, and the flaps so obtained by dissection were reflected backwards one over the other so as to overlap in the form of a double-breasted coat. Even so good approximation was difficult and relaxation incisions had to be made in the main sacrospinal muscle mass. Silk was used throughout for suturing purposes and it was used also as a darning material to cover the gap much in the same way as Ogilvie does for his herniorrhaphy.

The wound was then closed after liberally dusting the wound with penicillin-sulfamezathine powder. Elastoplast dressings were put on.

After-care.—The baby had a pulse rate between 140 and 150 after the operation and was in a fair condition. She was nursed on her face with the head end low. Temperature was 102°F. Intermittent penicillin was continued. On the 2nd day, the temperature was 103°F. and the pulse about 160. The child was taking nourishment well. The tension on the anterior fontanelle was not appreciably increased. On the 3rd day, the temperature began to come down, the baby was obviously better and on the 4th day the temperature was normal. Our respite however was short-lived as on the same evening she had a rise up to 102°F. and on the 6th day the temperature went up to 105°F. The wound was perfectly clean, the anterior fontanelle pressure was not high. The baby was not having convulsions and seemed to be There were only few fairly comfortable. abnormal lung signs and the two physicians who saw her made a very guarded and sceptical diagnosis of deep-seated broncho-pneumonia. The leucocytosis was 17,000.

At their suggestions, the baby was put on sulfadiazine tablets, penicillin 40,000 units every 3 hours, 25 per cent mag sulph solution 5ii given rectally b.d. and mist. diaphoretica with pot. brom. On the 7th day the temperature went up to 106°F. but thereafter began to come down gradually and reached normal again on the 10th day. Stitches came out on the same day. The wound had healed up by first inten-tion. The scar was firm and the patient was discharged on the 15th day (figure 3, plate IX).



Fig 1—Horizontal section of a fully engarged female, × 12.

Fig 2—Transverse -cetion of a fully engorged female, × 1.2

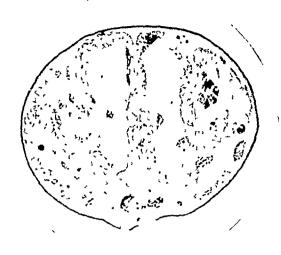


Fig. 3.—Tiansverse section of a fully engorged larva, \times 60.

A CASE OF MYELOMENINGOCOELE · \ K BASU (M H P) PAGE 183



Fig ·1.

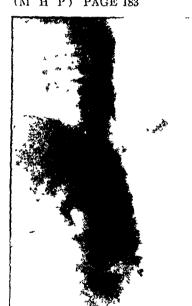


Fig. 2.

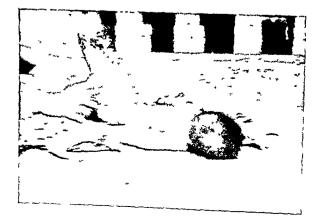


Fig 3.

The baby was examined a month and again 4 months after the operation. She was thriving well. The anterior fontanelle pressure was not raised at all. The scar was firm and well-healed.

Discussion

There are a number of points about this interesting case that merit discussion. First about the time of the operation. Surgeons differ widely about the most suitable time for operation of meningocoele. Mr. Wilfred Trotter (Choyce and Beattie, 1932) for example would wait until the 5th year before operation while Mr. Lambert Rogers (Turner, 1943) wants to operate within the first 10 days after birth. In a case of such various complexities, as meningocoeles are, it is very difficult to generalize, but one can say without hesitation that the operation, if and when indicated, should be done as early as possible—consistent of course with the general condition of the infant and other incidental factors.

Next about the actual operation technique. It has been said that the dural sac often partakes the function of arachnoidal granulations and absorbs cerebro-spinal fluid. Excision of the sac is therefore liable to lead to hydrocephalus. On this assumption it has been recommended that the sac should not be opened but after careful dissection should be infolded and replaced back in the canal. This procedure though correct in theory is often impossible in practice as in this case and its utility, to judge from this instance, is dubious.

The question of anæsthesia has already been discussed.

It has been said that myelomeningocoeles as opposed to simple meningocoeles are invariably associated with various kinds of deformities. Physical and neurological and therefore surgical intervention in such cases has generally been discouraged. That such is not always the case is clearly proved in this instance.

In conclusion, one realizes that the successful outcome of this operation resulted from the co-operation of the house medical officers, the nurses and the physicians whose helpful advice at a critical post-operative period was most welcome.

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APPENDICITIS DUE TO ENTAMŒBA HISTOLYTICA

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While symptoms simulating appendicitis may occur in amæbic infections without the appendix being involved, a good proportion of patients exhibiting such symptoms actually are suffering

from an invasion of the appendix by the parasite and the inflammatory condition of the organ brought about by such invasion. The following is an interesting case note of appendicitis due to *E. histolytica*.

In August 1945, I was called in to see a moderately built Mohammedan young man, aged about 35 years, with the following signs and symptoms. The patient was on the 11th day of his illness. He complained of fever, pain and tenderness in the right iliac fossa along with

general weakness.

On examination, I found movement of the abdominal wall over the right iliac fossa restricted with fullness of the area. The right thigh was drawn up and the patient complained of pain in the right iliac fossa on stretching the leg. On palpation a tender mass was detected which occupied the whole of the right iliac fossa and the right lumbar region. The mass was dull on percussion. There was no fluctuation.

The temperature was 101°F. The patient was apathetic and slightly toxemic with rapid pulse, dry tongue and headache. Liver and spleen were not palpable. Bowels were constipated. There was no evidence of any lesion

in the spine.

History of illness.—Ten days back he suddenly developed acute pain in the whole abdomen, more acutely felt round the umbilicus, after some time he had vomiting and there was slight rise of temperature. In the next few days the pain was localized to the right side of the lower abdomen. Bowels became constipated. The pain and tenderness in the right iliac region continued along with the temperature. The patient gradually became exhausted.

Investigation.—A blood count showed total W.B.C. 25,900 per c.mm. with polymorph. 90 per cent, lympho. 5 per cent, mono. 2 per cent, and

eosino. 3 per cent.

Urine was normal excepting a faint trace of albumin.

It was diagnosed as an appendicular mass following acute appendicitis and the following treatment was given: complete rest with headend of the bed raised, antiphlogistin applied locally and a plain alkaline mixture with bromide. For the first 3 days he was given antigasgangrene serum 10 c.c., anti-streptococcal serum 10 c.c. intramuscularly, soluseptasine 10 per cent 5 c.c. intramuscularly, glucose solution 50 c.c. (25 per cent) intravenously b.d. and sterodin 2 c.c. every day.

From the 4th to the 6th day: glucose 25 per cent 50 c.c. intravenously b.d., soluseptasine 10 per cent 5 c.c. and sterodin 2 c.c. every day.

From the 7th to the 10th day: glucose intravenously 50 c.c. b.d. and sulphadiazine by mouth 6 tablets a day.

With this treatment though the toxemia and temperature were controlled there was no reduction in the size of the mass.

On the 11th day of treatment (i.e. on the 21st day of illness), I consulted a surgeon who agreed

with the diagnosis and treatment and advised to continue with sulphadiazine and glucose intravenously. So practically the same course of treatment was continued for 5 days more without any appreciable reduction of the size of the mass.

Now at this stage (17th day) a blood count was done as sulpha drug had been administered for a pretty long time. This showed total W.B.C. 7,821 with poly. 68 per cent, lympho. 28 per cent, mono. 2 per cent and eosino. 2 per cent.

Sulpha drug was discontinued but glucose injections, antiphlogistin locally and alkaline

mixture were continued.

On the 26th day of illness the patient started passing liquid, black, tarry stools, with pulse rate accelerated. He was given calcium and

neohemoplastin in addition.

On the 28th day of his illness it struck me that all these signs and symptoms could be due to Entamæba histolytica. I examined the stool and found many specimens of motile Entamæba histolytica in the stool with a few cysts. I straightway started with emetine hydrochloride grain 1 on alternate days together with stovarsol 1 tablet and bismuth carbonate gr. 10 b.d. It was very gratifying to note that after 3 injections of emetine the mass was reduced to half its original size and after the sixth injection it completely disappeared. Convalescence was rapid and uneventful.

Summary

This is an uncommon case of appendicitis with formation of appendicular mass due to Entamæba histolytica infection. He gave no previous history of dysentery. Entamæba histolytica was found in the stool and subsequent treatment with emetine completely cured the patient.

A CASE OF MELIOIDOSIS

By S. SEN, B.SC., M.B. (Cal.), M.R.C.P. (Lond.), F.R.F.P.S. (Glas.), D.T.M. & H. (Eng.) Physician, General Hospital, Rangoon

J. R. R., Hindu male, aged 34 years, was admitted under me in the State Hospital, Rangoon, on the 3rd January, 1944, with fever and enlargement of the liver of one week's duration. The patient's condition was low although his temperature was not high; the maximum temperature noted in the hospital was on the second day of admission and it was only 101.5. Fever came down to below normal on the 4th day of admission. He gave history of dysentery. On examination the liver was found to be enlarged downwards with a swelling pointing in the epigastrium. It was very tender to the touch. His pulse rate ranged from 100 to about 130 per minute and the respiratory rate, which was near about normal on the first day, rose to 40 and more per minute on the second day. Pulse was of low tension and feeble and his general condition could be described as very low. Nothing abnormal was detected in the heart except that the sounds were feeble showing myocardial weakness. No abnormality was detected in the lungs. The spleen was not

palpable.

Considering the history of his having had dysentery before and the painful and tender swelling in the liver area it was diagnosed as a case of tropical abscess of the liver. His stool however did not show any Entamæba histolytica under the microscope. On aspiration of the swelling only a little blood and serum came out without any actual pus and this was sent to the laboratory for examination. As the patient's condition was very low nothing more could be done except to support the heart with strychnine and digitalin and camphor in oil. Only ½ gr. of emetine was injected intramuscularly on the first day of admission. The patient expired on the 5th day, i.e. on the 7th January, 1944.

As a result of aspiration it was thought that the case was not one of tropical liver abscess and as such a post mortem was decided upon. As permission could not be obtained from the relatives of the deceased a hurried partial postmortem only could be done. The liver was found to be enlarged and studded with multiple small and large caseous nodules with necrosis.

The naked-eye appearance of the liver gave us a suspicion of melioidosis with actinomycosis as other possibility. The liver was sent to the pathological department with a request to study the microscopic section and particularly for culture of the necrotic material with a view to finding out if it was a case of infection with Pfeifferella whitmori. It was found to be positive. So the case was diagnosed post mortem as a case of melioidosis.

Clinical picture

Symptoms of melioidosis vary according to the part or organ of the body affected and its true nature can be determined only by the cultivation of the *Pf. whitmori*. Two varieties are described. They are septicæmic and pyæmic forms.

Septicamic form.—This form is characterized by typhoid-like symptoms with continued fever, cough and bronchitis, the liver and spleen are often enlarged, and diarrhæa is not uncommon. Death usually occurs in the 3rd or 4th week. Very acute cases have been described which resembled cholera with vomiting, diarrhæa and collapse.

Pyæmic form.—Almost any organ may be affected. Lungs are the most common site and then comes the liver. The disease runs an acute course with fatal termination.

Prognosis

It is a fatal disease.

Diagnosis

Not many cases have been diagnosed correctly during life due probably to the fact that the

possibility of an infection with Pf. whitmori is not reinembered. A trustworthy diagnosis of melioidosis can be made only by cultivation of the causal organism. Pf. whitmori can be cultivated during the life of a patient from the blood, from the material obtained by splenic puncture, from the pus of hepatic lesions, from abscesses and sinuses, from superficial pustules, from the urine and occasionally from the sputum and cerebro-spinal fluid. Guinea-pigs can be inoculated with the material and subsequently examined.

Agglutination tests are of little value as the course is rapid and agglutinins are slow to develop; patients die before they appear.

Cases of melioidosis have been diagnosed as cholera, irritant poisoning, plague, malaria, enteric fever, general tuberculosis, pneumonia, malignant endocarditis, cerebro-spmal fever, glanders, smallpox, pyelitis, cystitis, prostatitis, parotitis, dysentery, acute mania, and hepatic suppuration and amœbic abscess of the liver.

Treatment

There is no specific treatment. Agglutinating serum of high titre can easily be made but it has practically no value in the treatment of an infection with *Pf. whitmori*.

Conclusion

Most of the cases reported were diagnosed post mortem, and less than a dozen of cases were probably diagnosed correctly before death. The disease is probably more prevalent than what appears in the literature. Many cases are not either reported or diagnosed due probably to the fact that the possibility of such an infection is not borne in mind.

Therapeutic Notes

NOTES ON SOME REMEDIES

XIX.-DRUGS IN ANÆMIAS, Part III

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Clinical Uses

Introduction

The red marrow of bones should be regarded as an important organ of the body, being concerned in adults with the production of red cells, granular leucocytes and platelets. In the case of red cells the parent marrow cell passes through various phases of development known as normoblastic before it becomes the mature erythrocyte. For proper maturation the red cells require: (1) protein, (2) vitamin C and probably some component of vitamin B complex, (3) iron and possibly traces of other minerals such as copper, (4) a substance known as the hæmopoietic principle which is contained in the liver, (5) internal secretions of thyroid and possibly anterior pituitary gland, and (6) very likely other substances as yet unknown. Deficiency of any of these factors may cause disturbance in blood formation, its degree depending on the nature of the substance that is lacking. Usually more than one factor is involved in the causation of anæmia, and as most of these factors are connected with defective diet or defective digestion and absorption, the problem of anæmia is largely a nutritional one.

A common cause of anamia is shortage of iron which causes deficiency of hæmoglobin in the red cells (hypochromic); such cells are also smaller in size (microcytic). Common examples are nutritional anæmia of infancy and many cases of anæmia of pregnancy. Another important cause is deficiency of the hæmopoietic principle from absence of either the intrinsic or extrinsic factor of Castle; when this occurs the development of red cells becomes megaloblastic, i.e. it proceeds along primitive lines, giving rise to a series of cells called megaloblasts which mature as large-sized erythrocytes known as macrocytes or megalocytes; these cells have normal saturation of hæmoglobin (normochromic). This occurs typically in pernicious anæmia and to a less marked degree in sprue, (It is important to remember macrocytic anæmia may be due to causes other than deficiency of the hæmopoietic principle and may occur without megaloblastic changes in the marrow.) Anæmias however do not always present such clear-cut blood picture and there may be almost any combination of these features as in some tropical anæmias owing to multiple deficiencies. Deficiencies of vitamin C and thyroid secretion have their own characteristic signs, the anæmia being only an incidental finding. Apart from these deficiency anæmias, there are others due to different causes, as for instance when the marrow is unable to utilize the food materials, but with these we are not concerned in this article.

Modern treatment of most common anæmias has attained a high degree of efficiency, but it must be based on scientific lines. Blood examination is essential, as it indicates the type of anæmia, the essential pathology and the correct line of treatment. In certain cases it is necessary to supplement it by examination of the bone marrow obtained by sternal puncture. It is said in excuse that blood examination is costly, but perhaps not more costly than the

expensive drugs that are often blindly prescribed. A common evil is the practice of prescribing all the available hæmatinics together without any regard for the actual needs of the patient. An iron deficiency anæmia may be cured at the cost of a few rupees, but not infrequently the patient is subjected to liver treatment for prolonged periods. On the other hand, a more serious mistake is made when macrocytic anæmia is treated with iron. Finally, an attempt should be made to find out the true cause of the anæmia, for it may be as varied as defective nutrition, ankylostomiasis or malignant growth of the stomach.

I. HYPOCHROMIC MICROCYTIC ANÆMIA

Red cells in relatively normal numbers but deficient in hæmoglobin. Microcytes. Colour index low. Achlorhydria or hypochlorhydria.

(1) In women

Defective food and multiple pregnancies are common causes in this country. A normal man needs 5 mg. of iron a day, but a woman up to the menopause needs two to four times as much, especially during pregnancy when she has to supply large amounts of iron to the fœtus. When the loss of iron is greater than the supply, anæmia is inevitable. Once the disease is established, diet alone is not sufficient to cure it. Iron is the only efficient treatment and it must be given in large doses at least 9 gr. of ferrous sulphate or 90 gr. of ferri et ammon citrate a day. In such large doses iron does not cause constipation. The lower the initial hæmoglobin and red cell count, the greater is the response to treatment. Within 10 to 15 days there is an obvious improvement and it usually takes one to three months to attain a normal blood count depending on the individual case.

In the majority of cases no special treatment is required for the complications that are commonly present. But, if necessary, dilute hydrochloric acid may be prescribed for dyspepsia and flatulence (one dram in a tumblerful of water flavoured with orange juice may be sipped during meals); vitamin B (yeast, marmite, bemax) for numbness and tingling or for the atonic constipation that is often present. The latter condition may need laxative, but purgatives should not be given as it causes intestinal hurry and reduces iron absorption.

Liver has no place in the treatment of hypochromic anamia, but occasionally it is of value when the action of iron is unusually slow, not for its hamopoietic principle but for the protein it contains. In such cases only whole liver or proteolysed liver should be used.

The diet should be a mixed one. Articles of food particularly rich in iron are liver, eggs, oatmeal, lentils and peas. Fish, chicken, milk, white bread and most fruits have a poor iron content.

(2) In infants and children

An infant is born with enough iron to tide it over during the milk-feeding period when the diet is deficient in iron. This store of iron progressively diminishes until it is put on mixed diet. As long as there has been adequate antenatal supply of iron and the infant gets full supply of breast milk, there need be no anxiety, but if the milk-feeding is unduly prolonged without iron-rich diet, anæmia will develop. This is because breast milk contains very little iron. Cow's and goat's milk has still less. Premature infants are very liable to get anæmic because they have not had the opportunity of acquiring their full share of maternal iron. Nutritional anæmia may cause little or no disturbance of general health but makes the infant very liable to infection which further aggravates the anæmia. Similar anæmia is also common in children among the poorer class for insufficiency of iron-containing foods. Among the other causes of anæmia in children, malaria and helminth infections are probably the commonest in this country.

The following are suitable preparations of iron for infants: (1) Ferri et ammon citrate gr. 3 (for 3 to 6 months) and gr. 5 to 10 (for 6 to 18 months) in glycerine and water, three times a day; (2) Ferrous sulphate gr. 1½, hypophosphorus acid dil M¼, dextrose gr. 15, aqua chloroform ad 5i, thrice daily (Mackay), (Dextrose retards oxidation of the iron salt, and hypophosphorus acid enhances this effect.) For prophylactic use in premature infants or after an attack of infection, half the above dosage can be given. As in adults, the drug should be started with a small dose (1|3 to 1|2 of the ultimate dose) and this is gradually increased. It is best given mixed with the feed or given at

the end of a feed.

Goat's milk may in itself cause anæmia and should not be given to infants.

(3) In hookworm infection

It is really an anæmia caused by chronic blood loss due to the infecting parasite. Iron in large doses will cure the anæmia even though the worms are still present. Anthelmintics should be given after the hæmoglobin is brought to a safe level. The subjects of hookworm infection are usually poor and a balanced diet is desirable.

(4) In post-hæmorrhage anæmia

In acute hæmorrhage the first step is to arrest the bleeding and restore the blood volume by transfusion with blood, plasma or serum, or in mild cases by giving adequate amounts of water orally. After the crisis is over, iron in full doses should be given. Whole liver, not liver extract, and vitamin C appear to have a definite value for this type of anæmia. Chronic blood loss may be due to gastric or duodenal ulcer, hæmorrhoids or menorrhagia, and is treated on the same lines.

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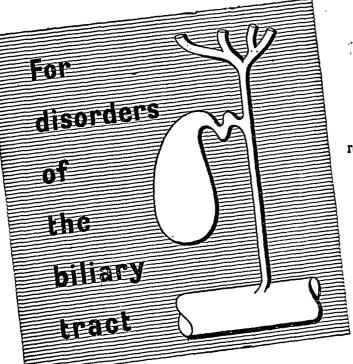
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Details of dosage and other relevant information on request

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Indian Medical Gazette

APRIL

BOOKS IN RUNNING BROOKS

or the books coming from overseas, from England and the U.S.A., are at present rather trying. Nearly half of them are printed on thick, highly-glazed, shiny and brittle paper like cheap cardboard. They can be read only at certain angles with the incident rays of light. Passages in them cannot be underlined in pencil. Even the page margin refuses to be marked. The leaves cannot be folded neatly and if forced into neatness break at the sewing. opening and closing of the book dislocates the torn leaves which thenceforward have to be kept as displaced members of the leaf community. One such book while containing only 900 pages weighed over 7 pounds.

The other half (nearly) are printed on blue, grey, thin, unglazed paper, riddled with holes of varying shapes and sizes. Two otherwise excellent English dictionaries were found to be

suffering from both these flaws.

After handling about twenty books conforming to the categories described above, one finds a book which would be quite good to look at, easy to read and convenient to manipulate, but The cloth used on the latter for the binding. Even the cockroaches of is a drab affair. Calcutta, which thrived before the war by licking the bindings of books belonging to the $1\frac{1}{2}$ million citizens in the second city of the British Empire, leave it alone.

One wonders what is wrong in Norway with the poplars and villagers who make the pulp as a cottage industry, with the paper mills and merchants elsewhere, and with the printers and binders in England and America. Our own printing press, which has been using the glazed cardboard-like paper for proofs for some time now, supplies the following information:

'This glazed cardboard-like paper used for sending proofs is actually the paper generally kept in stock for use of rough proof. It is either spoiled paper from original reams, unclaimed paper of parties, or otherwise very old paper really unfit for machine printing. It is now being used for proof purposes, otherwise it is

generally sold as waste paper'.

Now we know the truth. The publishers are making books out of waste paper. Perhaps new authors are being encouraged to write books. Probably from old authors some manuscripts which ordinarily would not have been accepted are being accepted.

The books are not what they used to be.

A contemporary in England is complaining of shortage of books and explains the situation thus:

'The paper available for printing books is at present controlled by a quota. The basic amount is 60 per cent of the pre-war quantity, and for educational (including medical) books and/or export a further 20 per cent is allowed. There is also a book publisher, reserve, which provides paper additional to the quota for printing books that in the public interest should be kept in print. In addition there is an export pool to meet bona fide export orders' (British Medical Journal, April 24th, 1948, page 800).

The same contemporary draws attention to difficulties over binding the books. The dearth of female labour and of cotton are responsible. The situation in respect of American books is also discussed. They are in greater demand in England than they were before the war. This accentuates the paper shortage in America.

Circulars of drug manufacturers, that used to be printed on thick blotting paper, are now printed on thin cardboard: one wonders if the cardboard is somehow or other derived from waste art paper.

Medical News

AUSTRALIANS TO TRY REFRIGERATION FOR ICE AN ÆSTHESIA

By H. W. SHERRING

(Abstracted from Release No. P/823, supplied by the Public Relations Officer, Australian High Commissioner's Office, New Delhi)

A REFRIGERATOR to freeze limbs for amputation, installed at Sydney Hospital, Australia, is believed to

be the first of its kind in the world.

Sydney Hospital authorities are at present (March

Sydney Hospital authorities are at present (March 1948) seeking temperature-recording-needles before putting the newly designed refrigeration into operation. Limbs to be amputated by refrigeration anæsthesia are generally packed in ice and chilled, the limb often having to be withdrawn while firsh ice is put in. With the new invention there will be no need for changing the ice. Temperatures of bones, muscles and skin will be taken by temperature-recording-needles without movement of the limb.

The refrigerator has been made on the absorption plan, with no moving parts of mechanism. It is operated on an electric element, and is easily wheeled about the wards.

about the wards.

Refrigeration anæsthesia by ice-pack is used in many countries, mainly for diabetic gangrene, internal diseased gangrene, and embolism due to very weak hearts. Patients (depending upon their nervous conditions) may be given a sedative, but in many cases this is not necessary. The operation is painless, there is no hæmorrhaging, and nowadays, with the use of penicillin, there is little fear of infection.

HOW BRITAIN'S NATIONAL HEALTH PLAN WILL WORK

(From a Leaflet No. F.423, issued by the British Information Services, New Delhi)

DETAILS of how the new National Health Scheme will affect doctors and patients in Britain have just been published.

Between now and 5th July, when the Act comes into operation, every man, woman and child making use of the service will be asked to make a choice of a doctor from the list of practitioners kept by local executive councils, For this purpose everybody who does not

come under the present health insurance scheme will be given a medical card. Those already insured will automatically receive a new card and will remain on their present doctor's list unless they wish to change. The choice of a doctor for children under 16 will be made by parents or a responsible guardian.

Patients will have a right to change their doctors

and a doctor can have a patient removed from his list by giving seven days' notice, but doctors of each area will be collectively responsible for all the patients

in that area.

It is laid down in the new regulations that no doctor practising alone may have more than 4,000 patients on his list, though this figure is raised where permanent assistants are employed. The practitioner's duty to the patient will include 'all proper and necessary treatment'. Services calling for special skill and experiment ence are not included, but the practitioner must take the necessary steps to enable the patient to receive specialist treatment if it is desired.

Annual payment

Separate lists of practitioners having obstetric experience will be kept by local executive councils to meet the needs of women requiring maternity treatment.

There is to be a fixed annual payment of £300 (Rs. 3,993-8-0) to a practitioner with the required minimum number of patients. In addition, he will receive a capitation fee and various subsidiary pay-

There are also to be special payments to induce doctors to serve in sparsely populated areas and other districts which do not offer attractive conditions. Further payments will be made for the training of assistants, provision of maternity medical services and for the supply of drugs and appliances.

In view of the fact that negotiations relating to the operation of the new Health Act are still proceeding between the Government and members of the medical profession, it is possible that there will be some modification of the regulations just published.

PREPARING THE WAY FOR NATIONAL HEALTH SERVICE

MEDICAL CARE OF 47,000,000 PEOPLE By GEORGE GRETTON

(From a Leaflet No. F.427, issued by the British Information Services, New Delhi)

The publication recently of a memorandum by Britain's Royal College of Nursing on the recruitment and training of hospital nurses is a reminder that in three months the great National Health Service will have begun to operate. The memorandum deals with the methods of improving the training and the conditions of work of Britain's nursing personnel and it calls attention to the great expansion in numbers which will be required as the National Health Service comes into full operation. It recommends further research into the ways of economizing the use of the available nursing personnel in order to help to enable it to meet all the demands which will be made on it.

it to meet all the demands which will be made on it. The scope of Britain's National Health Service has also been underlined by the recent financial estimates published by the Ministry of Health. Altogether £540,000,000 (Rs. 718.7 crores) are to be spent in the coming year on the main social services—National Insurance, Housing and Town Planning, Pensions, Health and so on. Of this sum, no less than £150,000,000 (Rs. 199.6 crores) will go to implement the new expanded National Health Service in England. Scotland and Wales. The expenditure in the past year was under £3,000,000 (Rs. 3.9 crores).

This big sum, translated into man-hours and

This big sum, translated into man-hours and materials, represents a very considerable inroad into the nation's resources at a time when they are being marshalled and controlled with the greatest care and skill to meet all the vast demands of post-war reconstruction. What does the nation get for this expenditure?

Contribution

When the Health Scheme comes into force on 5th July, it will apply to every person in the country. All those over the school age and up to 65 in the case of men, or 60 in the case of women, will contribute to the National Insurance Scheme at rates varying from 2s. 3d. (Re. 1-6-6) to 4s. 7d. (Rs. 2-14-0) a week. In return for this, they will qualify for unemployment and sickness insurance and programs on retirements. and sickness insurance and pensions on retirement, in addition to the services provided by the Health Scheme.

The National Health Service will offer free hospital and specialist services, free health centres where teams of doctors can be consulted, home nursing and midwifery services, dental services and numerous other special facilities. The service is based on the principle that prevention is better than cure and good health depends on many factors besides actual treatment of

the sick.

A big publicity campaign will be organized to let the public know of the facilities available and to encourage them to take positive steps to safeguard their health. Local authorities will provide special services for the care and advice of expectant and nursing mothers and young children. They will send Health Visitors into their homes, where necessary. They will provide domestic help for women after child birth and in other cases where it is needed on health grounds. Moreover, special facilities will be provided for handicapped people—the Ministry of Health has recently ordered 400,000 miniature hearing aids of a new pattern for the deaf, and these will be available free of charge to all those who need them.

Personal relationship

Many of these services are already being provided by the local health services—one of the great factors in maintaining the health of Britain's children at a very high level during the war and under the present difficult conditions has been the supply of priority milk and of vitamins to children and mothers. But the new service will expand, systematize and universalize them.

Furthermore, the operation of the scheme is something quite new in social service. Instead of the bleak impersonal and inhuman atmosphere which is apt to accompany a state system, the new service is to be modelled on private practice which has played so great a part in the social life of Britain. The general practitioner will remain a friend and adviser of the family and the whole personal relationship will be preserved.

The patient is free, under the scheme, to choose his own doctor. He can be accommodated in a private ward in a hospital, if he wishes, and he can get the services of the greatest specialists in the country free

of charge

This Health Service will be available for 47,000,000 people, so that it is not surprising that the nation will need to spend as much as £150,000,000 (Rs. 199.6 erores) a year in addition to the insurance contributions. At the present stage of post-war reconstruction, all the major allocations of resources are subject to the strictest priority, and it is sometimes asked whether the nation can afford expenditure on this scale at the present moment.

Need for priority

To ask this question is to misunderstand the whole basis of Britain's reconstruction. No one underestimates

the need for industrial and economic progress.

Britain paid heavily for the war and her voluntary effort was greater than that of any other country and her need to increase industrial production is correspondingly great. Output of steel and coal and all the other products which depend on these basic industries is of critical importance to the whole national living standard, and workers in industry are showing their realization of this in the high and rising production figures which they are achieving. But at the same time a fundamental principle of Britain's policy to-day is that reconstruction is for the benefit of the whole nation. Industrial production is simply a means to an end and the end is the social well-being of the masses of the people in the country. Failure to use the national resources directly, as well as indirectly, for this end would mean a sacrifice of the whole social ideals of Britain.

That is why, among the demands of post-war reconstruction, priority is given to this great social service. The Government of Britain realizes that, far from being unable to afford this expenditure, it cannot afford

not to make it.

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SCIENCE OF SEATING COMFORT

INCREASED EFFICIENCY IN WORKERS PROVED By NIKOLAUS WENDT

(From a Leaflet No. F.448, i-sued by the British Information Services, New Delhi)

On any stage where a modern English play is being performed, a typical British 'easy chair' is a sine qua non among the properties. To producers and stage-managers, it is the most direct expression of English comfort.

With its voluminous capacity, the easy chair is an indispensable part of every British household, however modest, and the relaxation it gives to every limb seems the well-carned reward of a day's hard work. Indeed, to some extent it is a measure of hygiene which refreshes worn-out energies and gives new power to

weary muscles.

The Anglo-Saxon race has always realized the importance of comfortable and anatomically correct seating. Consider the 17th century wooden chairs still widely in use in rural parts of Britain, often crude in appearance, but functionally perfect, and the products of 18th century British furniture designers like Chippendale, Sheraton and Heppelwhite, which are still very precious among collectors. The much-admired furniture of those days was not only designed for asthetic considerations, but to make chairs fit the body's requirements in every possible way.

Wrong notion

This aim, which culminated in the creation of the 'easy chair' at the end of the 19th century, has recently been drawn into the design of seating arrangements for work as well as for recreation. It used to be thought that responsible and absorbing work should be done standing, so as to keep the worker's attention alive, but the harmful effects of partial fatigue on efficiency and mental alertness in most kinds of work have now been realized.

Efficiency is increased, not by discomfort, but by properly adjusted comfort for both mental and manual workers. Medical and technical knowledge together

workers. Medical and technical knowledge together have now achieved notable results in the design of anatomically correct seating arrangements for work.

The first experiments in this direction were carried out during World War II, on behalf of Britain's Royal Navy, for the special benefit of sailors operating optical instruments or other maritime weapons. Seats had to be designed for these men so as to avoid physical fatigue without affecting mental electrones and yet fatigue without affecting mental alertness and yet, at the same time, to give them the freedom of movement needed to operate the equipment. Back-rests, seat upholstery, the angle of the legs when bent, support of the upper thighs and the arrangement of the footrest, all had to be studied and made to harmonize with the nature of human anatomy, paying special attention to the occupier's job.

Specialists' job

This research into the design of an 'ideal seat' for the Royal Navy's purposes was carried out by scientists of the Department of Human Anatomy at Oxford University. The result was a seat which has already been introduced aboard warships to be used

by aircraft spotters.

These scientists obtained anatomical, physiological and technical data which, appropriately adapted to civilian requirements, would enable seats to be designed for any form of industrial work, to avoid unnecessary fatigue among workers and increase their efficiency and well-being. Such special seats naturally allow adequate freedom of movement for the work concerned, and are carefully adapted to the most varied types

of machines.

This scientific research into correct and comfortable seating for practical industrial purposes, leads Britain's traditional craft of making functional furniture into a new phase. Sheraton, the famous furniture artist, prefaced one of his basic books on furniture design in

1790, with the following motto: 'Time alters fashions, and frequently obliterates the works of art and ingenuity; but that which is founded on geometry and real science will remain unalterable'.

Systematic scating science is in accord with these words by the founder of a time-honoured tradition.

REPORTS AND NOTIFICATIONS FROM THE MEDICAL COUNCILS IN INDIA MADRAS MEDICAL COUNCIL

INFORMATION having been received from the Super-intendent, Special Branch, C.I.D., Mylapore, Madras, through the Government of Madras by the Madras Medical Council alleging that Dr. (Miss) K. Carlsen, M.B., ch.B. (Edin.), Medical Superintendent, Danish Mission Hospital, Tirukoilur, made a palpably misleading report in regard to the death of a child Suganthi treated by her in the Danish Mission Hospital, Tirukoilur, whose death was certified by the said Dr. (Miss) K. Carlsen to be due to General Peritonitis, though it was alleged to have been caused by gun-(Miss) K. Carlsen to be due to General Peritonitis, though it was alleged to have been caused by gunshot injury. The Council held an enquiry on 22nd March, 1948, and found her guilty of infamous conduct in a professional respect and in exercise of powers conferred on it by Section 16(2) of the Madras Medical Registration Act (Act IV of 1914) the Madras Medical Council directed that the name of Dr. (Miss) K. Carlsen, daughter of Mr. J. H. Carlsen and holder of Medical Registration Certificate No. 4023, dated 30th December, 1927, be erased from the Madras Medical Register for a period of one year from 22nd March, 1948. 1948.

Office of the Madras (By Order)
Medical Council, No. 81,
Mount Roid, Madras (6).
Dated 22nd March, 1948.

(By Order)
V. GOVINDAN NAIR,
Registrar,
Madras Medical Council.

THE 48TH CHEMISTS' EXHIBITION, LONDON

THE 48th Chemists' Exhibition, London, will be held The 48th Chemists' Exhibition, London, will be held from 20th to 24th September next in the Central Hall, Westminster, S.W.1. This will be the first post-war Chemists' Exhibition in London. The management, 'The British and Colonial Druggist, Ltd.', will be pleased to welcome members of the drug trade from overseas who will be admitted on presentation of business card. Solely for the chemical and allied trades, it will reflect the latest advances in pharmaceutical and toilet preparations since the last Exhibition centical and toilet preparations since the last Exhibition held in 1938.

CALCUTTA MATERNITY ANDWELFARE COMMITTEE-DR. EDITH GHOSH FUND

Dr. (Mrs.) Edith Ghosh was brutally murdered some time back in her own residence in Calcutta. The Calcutta Maternity and Child Welfare Committee informs us that the Committee is endeavouring to informs us that the Committee is endeavouring to collect money in aid of the 'Dr. Edith Ghosh Memorial Fund'. We learn that this memorial is to take the form of a Maternity Bed in one of the Calcuta hospitals. We are informed that a sum of Rs. 1,000 has been promised to this memorial fund by the Calcutta Swimming Club as soon as Rs. 4,000 have been collected

Those who like to contribute to this memorial fund may send cheques made payable to 'The Secretary, Calcutta Maternity and Welfare Committee—Dr. Edith Ghosh Fund' and send to the Lady District Superintendent, St. John Ambulance Brigade, District II, 5, Government Place, Calcutta.

TELEVISION IN SURGICAL OPERATIONS (Reproduced from Lancet, ii. 29th November, 1947, page 802)

Last February surgical operations were televised for the first time at the Johns Hopkins Hospital, Baltimore. One camera was fixed 41 feet above the operating table,

and the image was so sharp that the numbers on a dollar bill placed on the table could be clearly read on the projection screens. A second camera was installed in the gallery to give a general view of the theatre; and the surgeon provided a running commentation. tary through a microphone. The experiment is said to have proved conclusively that demonstration of operations to a group of more than three or four is best effected by television, even though, for the moment, reproduction is only in black and white.

EMPIRE MEDICAL ADVISORY BUREAU

The Council of the British Medical Association approved the scheme of organization of the above Bureau on 29th October, 1947, and have appointed the following Committee of Management:

Chairman: Sir Hugh Lett, Bart., President, K.C.V.O., C.B.E., D.C.L., F.R.C.S.

British Medical Association.

Members:

H. Guy Dain, LL.D., Chairman of Coun-M.D., F.R.C.S. cil, British Medical Association.

J. L. Gilks, c.m.a., Chairman, Domi-F.R.C.S.

nions Committee. British Medical Association.

J. A. Pridham, M.C., Chairman, J.P., M.R.C.S., L.R.C.P.

national Relations Committee. British Medical Association.

L. R. Broster, o.B.E., M.A., D.M., M.Ch., F.R.C.S.

J. Lyle Cameron, M.D., F.R.C.S.. F.R.A.C.S.. F.B.C.O.G.

Brigadier E. C. Pepper, C.B.E., D.S.O.

A. E. Porritt, c.s.E., M.A., M.ch., F.R.C.S.

Charles Hill, M.A., Secretary, British M.D., D.P.H. Medical Associa-

British tion.

Medical Director:

H. A. Sandiford, M.C., M.B., Ch.B., D.P.H.

The services of the Bureau, which is housed at B.M.A. headquarters, will include the following particular objects:

(i) To make available the fullest information of facilities for post-graduate study and, where necessary, to provide the necessary contacts and introductions.

(ii) To maintain a register of suitable lodgings and hotels.

(iii) To arrange for practitioners from the Domi-

nions and Colonies to be met at the ports.

(iv) To supply a wide range of general information, including facilities for sport, travel, sight-seeing and

entertainment.
(v) To arrange private hospitality in doctors' houses.

(vi) By social functions and otherwise to enable practitioners from the Dominions and Colonies to meet each other and prominent members of the profession

in this country.

The Council has authorized the Committee Management to establish an Advisory Committee to nclude full representation of Government Departnents and Societies interested in the welfare of Empire and Overseas visitors during their stay in this country

or post-graduate education or other purposes.

The main object of most visitors will be to enlarge their professional knowledge, and detailed information on post-graduate educational facilities and on the courses of study necessary for higher qualifications will be available and, where required, the necessary contacts

and introductions will be provided. Visitors who wish to see something of the latest medical and surgical techniques can be put in touch with the appropriate practitioners in these and it is hoped that information on researches being carried out will also be available in due course.

The problem of finding somewhere to live is acute but every endeavour will be made to put visitors in touch with suitable lodgings and hotels.

Private hospitality in their homes has been offered by some doctors and it is hoped to develop further this aspect of the scheme.

Information about facilities for sport, travel, theatres, exhibitions, etc., will be available and visitors will thus be able to plan their leisure time as pleasantly as

Ignorance of various important details and regulations concerning food and clothing rationing, petrol allowances, customs duties, etc., may be troublesome and information can be given about these and any other personal matters to enable the visitor to feel at ease as soon as possible in what must be for many a strange land.

By social functions and in other ways it is intended to enable practitioners from the Dominions and Colonies to meet each other and prominent members

of the profession in this country.

Visitors may feel there are other ways in which the Bureau can be of service, or other subjects on which

they may need advice.

It will obviously enable the Bureau to be of most service to a visitor if he gives the medical director as long notice as possible of his intended visit and information on the following lines would be useful—projected date of arrival, mode of travel, if accompanied by mife period of travel, if accompanied by mife period of travel, if accompanied by mife period of travel. panied by wife, period of stay, main and other objects of visit and requirements from the Bureau. On arrival, a letter of introduction from the local Hon. Secretary of the Association, whilst not essential, would be welcome.

HEALTH FROM THE SEA BRITISH DISCOVERY SOLVES SURGICAL PROBLEMS By JOSEPH KALMER

(Reproduced from Release No. F.392, issued by the British Information Services, New Delhi)

Every time the wind creates a heavy swell, the sea deposits large quantities of a certain type of seaweed on the west coast of Scotland, on the Hebrides and on the coast of Ireland. The total amount washed up is estimated at some 5,000,000 tons a year. This seaweed has to be gathered quickly before the Atlantic tide carries it away again. Unfortunately, it still has to be gathered by hand, and as there are no machines made yet for the purpose, Scottish crofters are extremely busy after a storm. But attempts are now being made to construct machines for automatic gathering.

The reason why the harvesting of seaweed is so necessary is that many uses for alginic acid, which seaweed contains, have been found. Early in World War II, for instance, when there was a shortage of agar-agar, a substance hitherto imported from Japan for growing bacteriological cultures, it was discovered that a jully which was as adequate could be made from that a jelly which was as adequate could be made from Scottish seaweed. Good uses for alginic acid were found in wool manufacture, in cosmetics, in high-grade ice-cream, in tooth-paste and elsewhere. Factories were even set up at Girvan and Barcaldine in Scotland to turn seaweed into alginic acid which had become

so important industrially.

Alginic acid was discovered by Mr. E. C. Stanforth in 1883. While extracting iodine from seawed, he found that the weed contained another substance which could easily become a jelly, and he called this substance 'algin'. In the following decades many industrial uses were found for alginic acid, and later others were discovered in pharmacology. Every cough mixture contains alginic acid; pills are coated with it; and medical gauze, woven of alginic acid fibre, has the advantage not only of being sterile, but of being completely absorbed by the body. No danger results if a surgeon accidentally leaves any of it inside a patient, for it is absorbed quite harmlessly—it is even healthy. Factory workers smear alginic acid on their hands, where it forms a film which protects them from dust and dirt.

'Gelling' quality

The surgical use of alginic acid dates from 1941, when Solandt published the first report on it at Cambridge. A couple of examples will make the matter clear to laymen; surgeons interested in further details should study the various reports on it published by Dr. George Blaine, of the Strangeways Research Laboratory at Cambridge, who has made further discoveries in the surgical use of alginic acid.

If you have ever had pleurisy, you will know that the discharge can only be removed by making a puncture. The fluid collects between the two layers of skin which constitute the pleura. As soon as it is removed, the layers grow together again; but a scar is left which is often painful, especially when the weather changes. Formerly there was no means of avoiding this disadvantage. Dr. Blaine injected alginic acid between the walls of the pleura; it formed a film which prevented them from growing together again, so that there are now no after-effects from pleurisy, even when the weather changes.

Perhaps the most important property of alginic acid is that it works as a hæmostatic—of course, in a certain chemical combination. For such purposes calcium alginate has been made into a transparent, flexible film, a foam, a sponge, a gauze-like tissue or a kind of cotton-wool with a long staple. Calcium alginate can be combined with penicillin or other antibiotics and used to dress wounds, where it conforms to the underlying pattern, or inserted into the human tissue, where it is absorbed. The value of the discovery made by Stanforth is now being proved: the 'gelling' quality of alginic acid coagulates hæmorrhages.

Many new uses

This acid is so adaptable that the range of experiments is not yet exhausted, and many new uses will be found for alginic acid and its compounds. The main reason for this is, as Dr. Blaine says, that 'by choosing the appropriate concentration of a calcium salt and of the sodium alginate solution, and by using the required technique with which to prepare a formed "coagulum", many physical forms of the product can be made'.

be made?.

The fact that alginic acid is absorbed by the human body was not discovered until 1944, when calcium alginate was used in the treatment of fractures to 'anchor' phosphatase, a bone-building substance. Dr. Matthews of the Middlesex Hospital, London, then recommended sodium alginate solutions and emulsions instead of paraffin and glycerine; and in 1944, Gough injected it into the bronchia of lung of T.B. patients so as to block cavities without harming the patient

injected it into the bronchia of lung of 1.B. patients so as to block cavities without harming the patient.

Naturally, these uses were tried out on animals before they were applied to human beings. Thus experiments with animals showed that alginate wool would completely stop bleeding from the 'dura', as the crust of the brain is known, within a few minutes; hitherto this had been very dangerous. The wool was left in the trephine gap and the wound closed with sutures, the animal suffering no harm.

Alginic acid preparations have many other advantages over other pharmacological remedies. The clinical tests constantly in hand will show the steadily increasing range of application of alginic acid compounds.

CHEMICAL AWARD TO MERCK

The eighth biennial award for Chemical Achievement goes this year to Merck and Co., manufacturing

chemists, Rahway, N.J. George W. Merck, President, will accept it for his company during the exposition of Chemical Industries in New York.

The award is made by Chemical Engineering, a McGraw-Hill publication, of which Dr. S. D. Kirkpatrick is editor. It goes to Merck specifically for pioneering in the large-scale production of the 'wonder drug', streptomycin.

Soon after the discovery of streptomycin in 1944, Merck's laboratories began developing it. In 1945 the War Production Board authorized construction of two Merck plants to mass produce it. By early 1947 output had reached over 500,000 grams a month.

NAPT INFORMATION SHEET—APRIL 1948

Refresher Courses, 1918.—In conjunction with the Joint Tuberculosis Council the NAPT will organize the following Refresher Courses during 1948:—

For Doctors.—Radiology in connection with tuberculosis and chest diseases. At Leeds, 20th to 23rd September inclusive. Fee: £4-4-0 for Course. Accommodation 12s. 6d. per day including bed, breakfast and dinner.

For Nurses, Health Visitors, Almoners and Chief Administrators.—The social aspect of tuberculosis and chest diseases. At Leeds, 23rd and 24th September. Fee: £1-1-0 for Course. Accommodation 12s. 6d. per day including bed, breakfast and dinner.

The following are shorter and more intensive Courses for Doctors.—Non-pulmonary tuberculosis including hupus. At Lord Mayor Treloar Hospital, Alton, Hants. Limited number only. 5th, 6th and 7th October. Fee: #3-3-0. exclusive of hotel accommodation.

Clinical Courses. At Cheshire Joint Sanatorium, Market Diayton, Salop. 27th, 28th and 29th April; 11th, 12th and 13th May; 25th, 26th and 27th May, and during the autumn. Fee: £3-3-0 for Course. Hotel accommodation £1-1-0 per day.

during the autumn. Fee: 23-3-0 for Course. Hotel accommodation £1-1-0 per day.

NAPT Commonwealth and Empire Health and Tuberculosis Conference, 1949.—Will be held at the Central Hall, Westminster, London, on 5th, 6th and 7th July, 1949. Further details will be published later.

Publications.—Health Horizon—a quarterly illustrated magazine for the intelligent layman. Five shillings a year. April issue includes articles on: Alcohol; Why Wear Spectacles?; Snake-Bite and Antivenene; Adiposity.

Art Therapy: What It Is and How It Works.—A new illustrated leaflet for doctors and patients. Ten shillings a hundred; specimen copies free.

PRINCESS ELIZABETH OPENS LONDON EXHIBITION

(Reproduced from Release No. F.537, offered by the British Information Services, New Delhi)

Princess Elizabeth opened on 6th May an Exhibition near the Marble Arch, London, to celebrate the centenary of Britain's first Public Health Act. Entitled the 'Health of the People' Exhibition, it records 100 years of progress, between the passing of the first Public Health Act in 1848 and the inauguration of the National Health Service in 1948.

A full-size replica of a cellar slum of the 1840's recalls the insanitary horrors which beset millions of people at that time. From this introduction, models,

A full-size replica of a cellar slum of the 1840's recalls the insanitary horrors which beset millions of people at that time. From this introduction, models, diagrams, photographs and historical documents trace the fight which began with Edwin Chadwick, Lord Shaftesbury and other early reformers; the appointment of the first Medical Officer of Health, and the growth of personal health services.

'Press-bution quiz'

Coming to the present day, the Exhibition illustrates a wide range of public health services. Special sections demonstrate the process of mass radiography for the detection of early tuberculosis; the National Blood Transfusion Service; the Public Health Laboratory net-work; the work of the family doctor; the dentist, the specialist, the nurse, the midwife and the health

visitor; the medical officer of health and the sanitary

inspector and their staffs.

Novel features of the Exhibition include a 'press-button quiz'—push the knob and a panel lights up to give answers to a whole range of questions about the National Health Service, and a film which is set in motion by dialling 999, showing what happens when an ambulance call is made.

The Exhibition is open to the public from 7th May to 5th June, inclusive. A cinema is incorporated in the Exhibition in which Ministry of Health educational

films will be shown.

The Indian Medical Gazette Fifty Pears Ago

HYGIENE

(Reprinted from the Indian Medical Gazette, Vol. 33, April 1898, p. 152)

CIRCULAR Letter relating to Post-Epidemic Disinfection and Aeration issued by the Supervising Surgeon-General, U. S. Marine Hospital Service (PublicHealth Reports, December 3rd, 1897).—House-to-house inspection is recommended to obtain (giving number and street when practicable) complete lists of every kind of building in which yellow fever occurred, or where suspicious disease existed during the past summer and fall, the city or town to be divided into districts.

Every part of the premises must be carefully inspected, including the rooms, basements, cellars, passages, closets, and garrets; the sinks, drains, cesspools, latrines, privies, or waterclosets; the stables, sheds, outhouses, pens, etc. The inspection is not only for the purposes of disinfection, but includes the inspection of all streets, alleys and by-ways, and an examination into the water-supply, the proximity of wells, cisterns, and springs to suspicious surroundings; to ascertain the number of persons exposed to or who may have contracted the disease, and the result in each case; deaths, burial and under what precautions; recoveries or removal to another locality, city, town or place in order that necessary action may be taken.

General disinfection.—Disinfection is to be begun as soon as practicable after inspection. Removal of refuse, garbage, etc., the destruction of old rags, and other worthless materials wherever found be included in the work of disinfection. All parties are to be informed that the disinfection contemplated is harmless to houses and their contents, even to the most delicate

fabrics.

Disinfection of houses.—For this purpose formaldeliyde generators, or lamps, are recommended. All the contents of houses, including wearing apparel, should be spread about the rooms; bedding or mattresses, not used by the sick, should be placed upon chairs or tables, or, better still, hung up in the yards and

beaten; soiled bedding and mattresses used by the sick should be steamed or destroyed; trunks, closets, and bureau drawers, and all closed receptacles should be opened and their contents exposed.

Aeration .- Both before and after disinfection the houses should be opened and thoroughly

Disinfection of stables, pens, etc.—The use of bichloride of mercury solution, 1 to 500, or carbolic acid solution, 50 parts to 1,000 parts (applied by means of a spray), is deemed sufficient if all exposed surfaces are completely Privies may be disinfected by saturated. chloride of lime or strong solution of carbohe acid. Precautions such as these, it would appear, can only be safely taken against the spread of dangerous epidemic diseases in civilized countries. In some countries they would be regarded as a grievance; disturb the public tranquillity, and endanger human lives.

The Sanitary Aspects of Utopia Sanitary Record).—Mr. H. H. Spears, in a paper entitled as above, quotes the following from an address by Dr. Richardson in which he attempted to depict the glories of 'Hygeia: A City of Health': There are 20,000 houses in the city, with the average number of persons per house being five, thus giving a population of 100,000; the density of population being estimated at 25 persons per acre.

Those abominations of civilization, tall buildings, are not permitted, the highest buildings consisting of four stories only, not exceeding 60 feet in height. The houses are built on arches of solid brickwork, railroads are situated underground, and take all the heavy traffic. Trees abound along the public streets, and the spaces at the back of the houses are gardens, 'Tell it not in Gath, and whisper it not in the ear of the Askalon builders -there are no 4-feet passages at the rear of houses; streets are paved with asphalt and washed daily; glazed impermeable bricks, perforated transversely, are used for the outside walls; and bricks or tiles for the inside walls and ceilings are capable of being cleaned. Roofs are all but flat and used for cultivating flowers; kitchens are situated at the top of the houses. Bedrooms are light, roomy and well ventilated, giving each sleeper a cubic capacity of 1,200 feet.

Tailoring, shoe-making, etc., are not carried on in the houses of the artisans—separate rooms Public laundries are under the are provided. control of local authorities. Hospitals are provided for accidents only. The sewage is led on to sewage farms, the doctor failing to foresee the advent of the biological filter. The watersupply is derived from a river unpolluted by sewage, and carried everywhere by means of iron pipes, lead pipes being absolutely forbidden; ozone is supplied to every house for disinfecting purposes. Slaughter-houses are under public control, the animals being passed painlessly out

of existence in narcotic chambers.

Dr. Richardson advocates the disposal of the dead in carboniferous earth with vegetation of a rapid growth cultivated over it. Dr. Richardson concludes that, had this projected eity an actual existence, infantile diseases would be entirely unknown. Typhus, typhoid and cholera could only exist temporarily, and by pure accident; smallpox could be kept under control; rheumatic fever and a large proportion of the cases of pulmonary consumption would be prevented. Concerning the amelioration of

cancer and allied diseases, the doctor will promise little or nothing, and he thinks that scarlet fever, measles, and whooping cough will still continue to assert themselves. The death rate would be reduced to 8 per 1,000 or to 5 per 1,000 as prophesied by Chadwick. 'Utopia, itself, is but another word for time, and some day the masses, who now heed us not, or smile incredulously at our proceedings, will awake to our conceptions'.

C. BANKS, M.D., C.M., D.P.H.

Current Topics, Etc.

British Medical Association News

(Abstracted from the Medical Journal of Australia, Vol. I. 15th March, 1947, p. 344)

CEREBRO-SPINAL SYPHILIS

AT a meeting of the New South Wales Branch of the British Medical Association held on 19th September, 1946, at Sydney Hospital, Dr. E. H. Stokes showed a man, aged fifty-one years, who had been infected with syphilis while serving in the Russian Army in 1917. In 1931 the patient had noticed drooping of both his In 1931 the patient had noticed drooping of both his upper cyclids, which gradually became more pronounced. In view of the syphilitic history, the blood and the cerebro-spinal fluid were examined in 1938. The blood serum failed to react to the Wassermann test, as did the cerebro-spinal fluid, in which in addition no increase of protein or cellular content was found. In spite of the negative results to tests, the patient was given anti-syphilitic treatment by means of intravenous injections of arsenic and intramuscular injections of bismuth. No change was effected in his condition. In 1944 a No change was effected in his condition. In 1944 a coarse tremor affecting his right hand was noted, and early in 1946 slurring of his speech was observed. At the time of the meeting, in addition to double ptosis, tremor of the right hand and slurred speech, Rombergism with absence of the knee and ankle jerks was found to be present; but the pupils were equal in size and reacted to light. He was taking a mixture containing potassium iodide and mercury.

Dr. Stokes said that in view of the history and in

spite of the negative results to tests, it was considered that the patient was probably suffering from the so-called 'syphilitic disseminated sclerosis'.

Non-Specific Unerthritis

At the above meeting Dr. C. E. Marshall demonstrated a number of urethral smears illustrating the main types of urethritis which had been distinguished clinically by Dr. Gee. A typical smear from a case of gonococcal urethritis was shown to illustrate the abundance of pus cells and intracellular diplococci usually found. In contrast, smears illustrating the two commonest types of non-specific urethritis were exhibited; one showed few pus cells only, numerous epithelial cells and 'secondary organisms'—the so-called 'secondary urethritis', and one showed numerous pus cells and many epithelial cells, but no organisms, the urethritis being presumed cells, but no organisms, the urethritis being presumed to be caused by a filtrable virus. A photomicrograph demonstrating intra-epithelial inclusion bodies from a case of non-specific urethritis was lent by Dr. G. A. W. Johnston

Dr. Alban Gee in discussing treatment pointed out that urethritis with its attendant discharge was almost invariably secondary to prostatic and vesicular infec-tion, and treatment must be primarily directed towards these organs. For this reason prostato-vesicular massage and urethral dilatation formed the basis of treatment. The former should be performed twice a week for two or three minutes on each occasion. The massage should take the form of firm pressure rather than stroking and should work from the periphery towards the wrethen in the mid-line. The vesicles should be emptied, and lastly pressure should be applied in the mid-line. This should have the effect of squeezing the retained matter into the wrethen and clearing the prostatic ducts. It was a good plan to have the patient pass urine after the massage, to flush the weether and to allow inspection of the specimen. Urethral dilatation had the effect of compressing the Orethral dilatation had the effect of compressing the prostate and expressing the contents of its ducts, and thus large sounds had to be used. With regard to chemotherapy, Dr. Gee said that the 'secondary' type of urethritis, especially in the acute stages, responded well to sulphonamides and alkalis, or to penicillin. Arsenic had recently been used with some success in the 'virus' types. In all resistant cases urethroscopic and expressions exeminations should be made and cystoscopic examinations should be made.

White Penicillin

(Abstracted from the Pharmaceutical Journal, Vol. 158, 4th January, 1947, p. 3)

As from 1st January, 1947, a new form of penicillin white in colour has been available for commercial distribution in addition to the customary yellow penicillin. The white penicillin is produced by Imperial Chemical (Pharmaceuticals) Ltd., Glaxo Laboratories, Ltd., and by the Distillers Co., Ltd., at the Ministry of Supply Egytory Speke

of Supply Factory, Speke.

The following prices have been supplied by Glaxo Laboratories, Ltd., but it is understood that the rates also apply to the products of the other firms.

WHITE PENICULIN

Units	Single vials	Box of 10
100,000	2s. 9d.	27s. 6d.
200,000	4s. 9d.	47s. 6d.
500,000	10s. 6d.	105s. 0d.
1,000,000	20s. 0d.	2003. 04.

Trade discount 331 per cent; medical discount 10 per cent.

From 1st February, 1947, the prices of ordinary penicillin have been reduced as follows:

ORDINARY PENICILLIN

Units	Single vials	Box of 10
100.000	2s. 0d.	
200,000	70 0 1	20s. 0d.
500,000		$35s. \ 0d.$
	8s. 0d.	80s, 0d.
1,000,000	15s. 0d	150° 0 <i>d</i>

Trade discount 331 per cent; medical discount 10 per cent.

Ordinary penicillin supplied from 1st January, 1947, has been invoiced at the new rates. The new prices will apply to hospitals, less 331 per cent and to doctors, less 10 per cent from face price.

Penicillin sodium salt possesses a number of special characteristics which are of interest in medical practice:

characteristics which are of interest in medical practice:

(1) The standard of purity is exceptionally high so that the possibility of toxic reactions following its administration is reduced to minimum likewise a possibility of causing pain on injection is also minimized.

(2) It has a potency of at least 1,600 i.u. per mg. and contains not less than 96 per cent of penicillin G (II).

(3) It is a white, odourless powder, stable at ordinary temperatures and may be stored without refrigeration. It is, however, recommended that it should be stored below 77°F. (25°C.). (4) It is very readily soluble in water giving an odourless solution. Solutions for injection can be prepared in concentrations up to 1,000,000 units per mil.

The Oral Use of Penicillin

(Abstracted from the *Pharmaceutical Journal*, Vol. 158, 4th January, 1947, p. 3)

It is generally accepted that penicillin is much less effective when given by the mouth than when it is injected. Recently, it has been shown that when given in adequate doses penicillin by the mouth may be effective in gonorrhæa. Its value by this route and in this condition has been investigated by Bushby and Harkness, who treated orally 62 cases of gonorrhæa with six doses of penicillin, each of 40,000 i.u. and sodium citrate 1 gm. every three hours. When given in uncoated tablets penicillin appeared in the blood within 30 minutes, reached a peak in about 1½ hours, and disappeared in 5½ hours. With entire coated tablets penicillin was not detectable in the blood until after 2½ hours. Fluids were restricted to 1½ pints. Only two cases relapsed, a rate which compared favourably with the authors' experience of parenteral therapy.

B.C.G. in Norway

(From the British Medical Journal, ii, 5th July, 1947, p. 39)

AT a meeting of the Tuberculosis Association of Norwegian Doctors, a resolution, unanimously adopted, included this statement: 'The Tuberculosis Association of Norwegian Doctors recommends to the Department for Social Affairs the promotion of proposals for a law dealing with general B.C.G. vaccination of school-children of the national schools at school-leaving age, army recruits, and other young people, as well as of other population groups which are particularly exposed to infection with tuberculosis'.

Tropical Medicine

By E. C. FAUST

(Abstracted from The Journal of the American Medical Association, Vol. 132, 21st December, 1946, p. 965)

Since 1939 important developments have taken place in the field of tropical medicine. This has resulted in part from accelerated commercial contact with tropical countries but is due in an even greater degree to military needs of World War II. Much has been learned about the pathogenesis of disease, particularly Bancroft's filariasis, schistosomiasis, scrub typhus, Bullis fever and sandfly fever. Valued aids have been perfected for the diagnosis of schistosomiasis, filariasis, the typhus group of diseases, amœbiasis, bartonellosis, kala-azar, oriental sore, espundia and Chagas' disease. Effective immunization has been developed for typhus, while plague and cholera vaccines have been improved. Protective vaccines for scrub typhus, dengue and possibly sandfly fever may soon be developed.

In the realm of therapy the claims for quinacrine hydrochloride as a good antimalarial have been amply demonstrated. This drug is not only the equal of

quinine in the treatment of clinical malaria but has proved to be highly satisfactory as a suppressive agent. Of the thousands of natural and synthetic substances which have been tested as potential plasmodicides, two chloroquine (7-chloro-4-[4-diethylamino-1-methylbutylamino] quinoline) and paludrine (N₁-para-chlorophenyl-N₅-isopropylbiguanide acetate) will soon be available commercially. Both of these promise to be superior to quinacrine. Solustibosan (sodium antimonyl gluconate) and stilbamidine (4, 4'-diamidino stilbene) are new drugs which are effective in the treatment of kalazar. Suramin sodium (Naphuride; Bayer 205) has been found useful as a prophylactic in African sleeping sickness. No new amæbicidal drug has been developed since 1936, when diodoquin was introduced. While antimony and potassium tartrate is still the best available therapeutic drug for schistosomiasis, experimental studies indicate the possibility that another antimonial and certain amino-anthraquinones and phenothiazines have more specific action against schistosomes. No eminently satisfactory treatment has been developed for filariasis and no new drugs have been discovered for the intestinal helminthiases.

Para-aminobenzoic acid has proved to be relatively specific in the treatment of the typhus group of diseases, while sulfonamide drugs have been found to be useful in bacillary dysentery and plague, and 100 per cent effective in cholera when administered together with plasma. Penicillin is specific in yaws, pinta

relapsing fever and leptospirosis.

On the preventive side the discovery that DDT is an effective insecticide against mosquitoes, filth flies, lice and other arthropod transmitters of diseases has made possible the rapid control of malaria, filariasis, dengue, enteric diseases transmitted by filth flies, and typhus and relapsing fever contracted as a result of louse infection. New more powerful insecticides are on the horizon. Dimethyl phthalate, dibutyl phthalate and benzyl benzoate have proved to be highly effective repellents in warding off mosquito-transmitted diseases, and when impregnated in clothing greatly reduce exposure to scrub typhus and schistosomiasis. Finally, sodium fluoroacetate has been demonstrated to be superior to other poisons for eradicating domestic and wharf rats.

Therapeutic Possibilities of Curare

(Abstracted from the Journal of the American Medical Association, Vol. 132, 21st December, 1946, p. 993)

The isolated pure crystalline substance, tubocurarine, belongs to a group of compounds known as quaternary ammonium salts. These salts possess the property of paralysing neuromuscular conduction at the myoneural junction. The present-day concept of curare therapy does not propose to paralyse the myoneural junction but to create a block to the abnormal impulses imposed on the myoneural junction by the disease. A therapeutic effect is obtained without the loss of voluntary

power

The therapeutic effects are reported in a group of 200 patients who have received a total of 1,500 injections of a suspension of d-tubocurarine chloride in white wax and oil. The proportions of the suspension are 3 per cent tubocurarine in 4.8 per cent wax in peanut oil. One c.c. of the suspension contains the equivalent of 175 units of standard curare. The preparation is well standardized and its action predictable, milligram for milligram. It is given by either the subcutaneous or the intramuscular route. The following types of disorders were reported in this series:—I. Muscle spasm, as in (a) direct trauma to muscle, (b) low back syndrome, (c) orthopedic deformities with reflex spasm, (d) myositis, (e) arthritis. II. Spasticity, as in (a) degenerative diseases of the central nervous system, (1) multiple sclerosis, (2) disseminated sclerosis, (3) familial lateral sclerosis; (b) spinal cord injury, (c) cerebrovascular disease, (d) tumours of the brain and spinal cord. III. Spasticity with dystonic features (Little's disease, cerebral

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Vitamin Therapy-its uses and limitations

A SINGLE SUPPLEMENT FOR SAFER PREGNANCY

Adequate safeguards against the hazards of pregnancy are now routine in practice. Among these, the provision of essential foods to pregnant women has had a significant effect in reducing maternal and infant mortality. Cases still occur, however, in which full advantage is not taken of the nutrients present in foods. Where patients are found to be anomic, debilitated or showing signs of subnormality in respect of the protective factors, the simplest prescription for ensuring an adequate intake of a wide range of nutrients is that of

PREGNAV

The recommended daily dose provides:

vitamin A	2,000 i.u.	vitamin E	r mg.	iodine) not less
vitamin D	300 i.u.	nicotinamide	25 mg.	manganese	than 10
vitamin B, vitamin C	o.6 mg. 20 mg.	calcium iron	160 mg. 68 mg.	copper	p.p.m. cach

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Fig. 1



Fig. 2

WELL-LEG TRACTION

Using Gypsona P.O.P. Bandages

March 6th .- Patient, aged 66, sustained transtrochanteric fracture of the left femur (Fig. 1).

March 6th .- Fracture reduced and fixed in modification of the well-leg traction technique. Using Gypsona, a snug-fitting plaster casing was applied and anchored to the uninjured leg (Fig. 3). X-ray showed good reduction, which was maintained satisfactorily without need for any change of plaster during the two months in which it was retained.

April 30th.-X-ray examination showed good position and good callus formation proceeding (Fig. 2).

Comment.-This method obviates the necessity for pins transfixing the heel or tibia, it enables the patient to sit up in bed, and thus materially reduces the risk of hypostatic pneumonia and pressure sores. It is essential that during fixation of the cross struts the injured leg is pulled, and the well-leg pushed, so that the top of the plaster is firm against the tuber ischii.

These details and illustrations are of an actual case. T. J. Smith & Nephew, Ltd., of Hull, England, manufacturers of Gypsona P.O.P. and Elastoplast bandages, publish this instance-typical of many-in which their products have been used with success.



Fig. 3

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An outstanding advantage of VEGANIN is the rapidity of its action. In influenza, headache and muscular pain are promptly alleviated; the temperature is reduced; exhaustion and restlessness yield to its sedative influence. The distressing "influenzal cough" is relieved and beneficial sleep ensured. Veganin, thus, conserves the patient's defensive energies.



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diplegia). IV. Dystonia and athetosis. V. Rigidity

as in Parkinson's syndrome.

In the group characterized by spasm the results were gratifying, all degrees of spasm yielding to treatment, although when the pain was based on root compression, although when the pain was based on root compression, residual root pain remained after complete reduction of reflex muscle spasm. This response can be used diagnostically in ruling out root compression as a causative factor in a clinical picture. In the spastic group it was found generally possible to increase motor efficiency by climinating the increased excitability of the stretch reflex. Voluntary power was unaffected at design levels sufficient to relieve supsticity. In every the stretch reliex. Voluntary power was unattected at dosage levels sufficient to relieve spasticity. In every case the gait was improved by this effect. Retraining enhanced this new level of performance strikingly. In the group of birth injuries, cerebral diplegia or spasticity with dystonic features, improvements were obtained in this sequence:—(1) speech, (2) ability to sit quietly, (3) gait, and (4) eating, writing and the performance of all skilled motor activities. These patients have maintained their improvements on doses patients have maintained their improvements on doses twice weekly. In dystonia and athetosis it was possible to reduce spontaneous movements so that patients could to reduce spontaneous movements so that patients could sit quietly for reasonable periods, make active exercise and motor training possible and improve sleep. In patients with Parkinson's disease it was possible partially to relieve rigidity and to improve sleep. Tovic effects on any organ or system or changes in body economy or general well-being were not noted. There was no tendency to habituation. There exist certain contra-indications to the curare therapy, in particular any myasthenic tendency and kidney disease. particular any myasthenic tendency and kidney disease.

Tic Douloureux: Report of a Case Successfully Treated with Intravenous Typhoid Vaccine

By R. PAULL

(Abstracted from American Practitioner, Vol. 1, December 1946, p. 214)

THE literature dealing with the use of typhoid vaccine in the treatment of tic douloureux has been reviewed

and found very limited.

The minimum effective dose is used as a starting dose of approximately five million organisms and the dose increased as the patient's tolerance indicates. The interval between doses should be an absolute minimum

of 48 hours.

One should he especially cautious in administering the plain or mixed vaccine to debilitated or aged patients, patients with blood dyscrasias, and those with vascular or renal disorders.

The patient should be kept at complete rest under close observation until the reaction has disappeared.

The unusual reactions to intravenous vaccine

include :-

1. Stimulation of an infection or non-infectious inflammatory focus. (This may be harmful as in the case of tuberculosis, or beneficial in certain other cases.)

Stimulation of certain diathetic phenomena. Vasomotor changes.

Intravascular chemical changes which may produce thrombosis or vasomotor imbalance.

5. Anuria.
6. Sanarelli-Schwartzman phenomenon.
The successful use of triple typhoid vaccine administration. tered intravenously in the treatment of a case of tic douloureux of 39 years' standing has been described in a case report.

The treatment has the following advantages: (a) It promises to be a valuable therapeutic test seeming to be ineffectual in conditions simulating tic douloureux.

(b) It is less painful, less dangerous and beset by fewer complications than are alcohol injections or surgical interruption of the trigeminal tracts.

(c) While it is not 100 per cent effective, it is effective even in many of those cases who get incomplete relief from alcohol or surgery.

(d) It can be offered to those too old or feeble for consideration of surgical intervention.

(c) It is available to those who have an undue fear of surgery or injection with alcohol. (Such a case is reported.)

A Study on Hodgkin's Disease

By ERNEST LYON, M.D.

Jerusalem

(Abstracted from Acta Medica Orientalia, Vol. VI, No. 8, August 1947, p. 258)

The author emphasizes that the normal survival period in Hodgkin's Disease is 2 to 2½ years from the onset. If, however, radium therapy is given, the prognosis is considerably better, many patients living as long as fifteen years, and others even regarded as

The author agrees with the views of Hadfield and Garrod that fibroid myeloid reticulosis would be the most adequate cytological classification. The true nature of the disease still remains obscure, and might be considered as an inflammatory process as well as a malignant disease. The author goes into the pathology, and reviews some of the evidences in favour of a virus origin.

A REPORT IS GIVEN OF A CASE UNDER TREATMENT Reviewer's opinion

The article in question gives a concise account of the pathology of Hodgkin's Disease, and lays very necessary stress on the value of x-ray treatment combined in some cases with liver therapy. He does not adequately stress the fact that even at its inception lymphadenoma is a generalized disease and almost certainly not a localized one. For this reason far the best results have been obtained by Prof. Gilbert of Geneva and others by giving a course of x-ray therapy to the entire lymphatic system. Gilbert uses ten areas including both deep cervical, mediastinal, abdominal and inguinal. He gives a total of 2000r to each area, fractionated over anything up to ten weeks. The reviewer has used this technique with very fine results over the past fifteen years.

The Toxicology of the Newer Metals

By L. T. FAIRHALL

(From the British Journal of Industrial Medicine, Vol. 3, October 1946, p. 207, as abstracted in the Bulletin of Hygiene, Vol. 22, June 1947, p. 403)

This is a valuable summary of present knowledge of the hygiene significance of 13 of the 'newer' metals, namely those now taking an important place in industry.

The metals discussed are beryllium, cadmium, cobalt, columbium, indium, osmium, platinum, selenium, tantalum, tellurium, thorium, uranium and vanadium.

Agglutination of Red Cells by Mononucleosis Serums

By F. M. BURNET

and

S. G. ANDERSON

(From the British Journal of Experimental Pathology, Vol. 27, August 1946, p. 236, as abstracted in the Journal of the American Medical Association, Vol. 133, 4th January, 1947, p. 67)

BURNET AND ANDERSON show that the virus of Newcastle disease of fowls agglutinates human cells and is eluted therefrom in the same fashion as influenza viruses. Cells treated with amniotic or allantoic fluid preparations of Newcastle disease virus develop a new

antigenic character which allows them to be agglu-tinated to high titre either by experimental Newcastle disease virus immune serum or by most serums from recent cases of infectious mononucleosis in man. changed character of the cells is due to the adsorption to their surface of an agent other than the virus produced during the growth of Newcastle disease virus in chick embryo cells. The possible significance of this agglutination reaction as a lead to the ætiology of infectious mononucleosis is discussed.

Sickle Cell Anæmia: A Race Specific Disease

(Abstracted from the Journal of the American Medical Association, Vol. 133, 4th January, 1947, p. 33)

THE most significant feature of sickle cell anæmia is that its occurrence depends entirely on the presence of Negro blood, even though in extremely small amounts. The disease was discovered in Chicago in a Negro medical student whose forebears had long since adopted Western civilization. Hundreds of cases of sickle cell anæmia had been demonstrated in American Negroes before it was even found to occur in Africa,

the accepted place of its origin,
All the cases were at first in Negroes. Then further reports began to appear indicating its occurrence in people other than Negroes. Some of these were instances of diseases with other forms of distorted erythrocytes, but after the mistaken and questionable cases had been eliminated true sickle cell anæmia or its related condition, sicklamia, was proved to occur in Cubans, Mexicans, Italians, Greeks, Arabs, Portuguese, Egyptians, South Americans and native White Americans. It seemed that the original idea of sickle cell anæmia being strictly a Negro disease had to be

Nevertheless, it appears that for the occurrence of sickle cell anamia the presence of a strain, even remote, of Negro blood is essential. Those people other than Negroes in whom the disease is found are either numbers of the so-called Mediterranean races who, anthropologists say, as a result of their proximity to Africa, have acquired a considerable infusion of Negro blood, or White Americans whose families have at some time lived in or near the former slave states. Participation of Negroes in European wars and other circumstances of Negroes in European wars and other circumstances of history brought the Negro race into close contact with many groups of white people and resulted in a wide diffusion of African stock. The disease has never been found in countries such as Britain, where the opportunity for mixing with Negroes has been small, and is regularly found in countries such as Latin America, where there has been frank interbreeding with African people. In no case of the sighling trait in a African people. In no case of the sickling trait in a white person reported up to the present time has the possibility of admixture of Negro blood been definitely excluded. The presence of the trait is a proof of an

excluded. The presence of the trait is a proof of an admixture in the immediate or remote ancestry.

Sickle cell anæmia (or sicklæmia) is transmitted according to mendelian law as a dominant characteristic. The dominant nature of the gene probably accounts for the large influence of small amounts of Negro blood on the occurrence of the condition. It has been suggested that sickling of erythrocytes arose in Africa and was transmitted by inheritance to as a mutation and was transmitted by inheritance to other members of the Negro race as well as to the offspring of intermixtures with them. Although the sickling trait occurs in 15.5 per cent of the true Negroes of West Africa and in as high as 15.0 per cent of American Negroes, the reason it has not become almost universal in Africa and among American Negroes is probably that many patients with sickle cell anæmia do not survive to adult life.

Perhaps there are other diseases that are also absolutely dependent on the presence of a specific racial strain. Ainhum, for instance, is a likely candidate for this category, since it apparently occurs only in Negroes. Although race is thus a strong ætiologic factor, the rôle of other factors is not clear.

'Antidotal' Property of Filtrates of Penicillium Notatum

(Abstracted from the Journal of the American Medical Association, Vol. 133, 4th January, 1947, p. 33)

Ir has been demonstrated that filtrates of cultures of Penicillium notatum possess 'antidotal' power against certain exotoxic bacterial toxins. When 2 c.c. of staphylococcic toxin of the strength of 400 hemolytic doses to 1 c.c. were mixed with 2 c.c. of a filtrate of a culture of Penicillium notatum containing 90 international units of penicillin per cubic centimetre and the mixture was kept in an incubator at 37°C., the 800 hæmolytic doses of the toxin contained in this mixture were completely inactivated in three hours, while 1,600 doses were neutralized in six hours. Experiments on guinea-pigs showed a complete destruction of 150 fatal doses of diphtheritic toxin when mixed with 2 c.c. of a filtrate of Penicillium and kept for twenty-four hours at a temperature of 37°C. The toxin itself when exposed to the temperature of 37°C for the same duration of time did not lose any of its effectiveness when exposed to temperatures of of its effectiveness when exposed to temperatures of 18°C. to 20°C.; when exposed to a temperature of 5°C, the mixture produced its effect at a slower tempo. Heating of the filtrate to 55°C, for one-half to one hour did not increase its 'antidotal' property. The filtrate becomes less effective at temperatures above 60°C. Addition of 0.5 c.c. of solution of formaldehyde to 100 c.c. of the filtrate with or without heating it to 55°C. for one-half to one hour did not appreciably alter its effectiveness. The inactivating or antidotal property of the formaldehyde treated and warmed filtrates of Penicillium notatum persists for as long as three months if kept at a temperature of 5°C. Addition of human serum to the mixture of staphylococcic toxin and filtrate of Penicillium notatum does not alter the 'antidotal' effect.

'antidotal' enect.

The term 'antitoxic' is not used because the latter applies to the property of antitoxins to neutralize the corresponding toxins. The term 'antidotal' seems to be justified in the present case because it describes a substance capable of annulling the noxious effect of bacterial toxins whether that is accomplished by decompaning them or by combining with them. Penicilling posing them or by combining with them. Penicillin apparently loses this 'antidotal' property in the process of its derivation and purification. The authors believe that certain precautions observed in the process of preparation of penicillin may at least partly avoid these undesirable effects. They stress the importance of developing techniques for concentration and purification developing techniques for concentration and purification of penicillin which will conserve these antagonistic principles. An excellent precaution is to add formal-dehyde in proper proportion to the cultures of Penicillium before their filtration or to the filtrates themselves or to both or to subject them to the action of formaldehyde and heat simultaneously. In this way the filtrates will be protected in the course of their preparation and in the course of their utilization against contamination with certain micro-organisms favour the production of penicillinase, the latter being

destructive of the antagonistic properties of penicillin.

The discovery of the 'antidotal' quality possessed by the crude filtrates of Penicillium notatum suggests that the same property is probably possessed by filtrates of other antagonistic germs and enlarges greatly the possibilities in the domain of antimicrobic therapy.

Tridione in the Treatment of Epilepsy

By WILLIAM G. LENNOX

(Abstracted from the Journal of the American Medical Association, Vol. 134, 10th May, 1947, p. 138)

TREATMENT with 3, 5, 5-trimethyloxazolidine-2, 4-dione (Tridione) has been evaluated in 218 epileptic patients. It has proved wonderfully effective in controlling the petit mal triad, petit mal (pyknoepilepsy), myoclonic jerks or akinetic seizures. Of 166 patients who had

frequent daily seizures of this type, 83 per cent were better and 31 per cent were freed of this form of seizure. The proportion of children who were freed of petit mal, but also (because of cerebral pathology) the proportion of those not helped at all, was greater for younger than for older children. Great frequency of seizures was no bar to success of treatment with this drug.

In contrast Tridione was helpless against convulsions. Of 58 patients having frequent grand mal seizures (with or without complicating petit mai) 21 per cent had less or without complicating petit mail 21 per cent had less frequent and 50 per cent had more frequent convulsions. The drug when used alone was ineffective in 35 patients having psychomotor seizures, but in a minority of cases it supplemented the therapeutic action of diphenylhydantoin sodium.

Of the various side-effects rash and hemaralopia (photophobia) were most frequent. The first was most pronounced and the second least pronounced in young

pronounced and the second least pronounced in young children. Most serious is a possible toxic effect on the bone marrow. Monthly blood examinations with discontinuance of medication, if neutrophils fall below 1,600 per cubic millimetre, seems to provide adequate protection.

Use of this drug is contra-indicated for patients who have convulsions (grand mal) only. It must be used circumspectly or in combination with some anti-convulsant if the patient has both petit mal and convulsive seizures. It is clearly the drug of choice in the treatment of the petit mal triad.

Three cases of toxic amblyonic (which cleared when

Three cases of toxic amblyopia (which cleared when medication was stopped) and of two additional deaths from aplastic anomia (probably without preceding blood

examinations) have been known.

On preliminary trial, an experimental homologue of Tridione (dimethylethyloxazolidine dione) seems to be somewhat more effective in controlling petit mal and to exhibit somewhat less toxicity.

Temporal or Giant-Cell Arteritis

By K. ROBERTSON

(Abstracted from the British Medical Journal, ii, 2nd August, 1947, p. 168)

In a period of little more than a year four cases have been seen in which a diagnosis of temporal or giant-cell arteritis has seemed justified. In two of these biopsy produced incontrovertible evidence, while

the other two were clinically most suggestive.

The clinical picture is sufficiently characteristic to suggest the diagnosis. The patient is always in the He may have been in good health prior to the gradual onset of a subacute illness in which fever, severe cephalalgia, anorexia, depression and general toxemia figure prominently, and arthralgia, myalgia, scattered lesions in the central nervous system, and interference with vision are often seen. Physical signs depend upon the situation of the disease, but tender thrombosing arteries about the skull are an almost constant finding. A low-grade secondary anæmia is common; a slight increase in white cells, sterile blood culture, normal blood urea, negative Wassermann reaction, but almost invariably raised blood sedimentation rate complete the picture.

In considering diagnosis, the age of the patient is against the possibility of periarteritis nodosa, in which condition younger individuals are attacked and in which the visceral vessels suffer severely. A high blood urea is almost constant and mortality is high. In temporal arteritis, though visceral vessels are by no means immune, they suffer less constantly, nitrogen retention is unusual, and mortality is relatively low, Buerger's disease appearing again at an earlier age, attacks particularly the arteries of the legs and frequently results in gangrene.

The disease often lasts up to a year; it seems to be self-limited, and is rarely fatal. No specific organism has been discovered to be causative, nor does

drug allergy appear to play any part, as seems so probable in perarteritis. From experience in one case, penicillin appears to be without effect. The writer wonders whether the use of the anti-coagulants heparin or dicoumarol early in the disease might not reduce the risk of permanent damage, especially in the brain and retina.

Molecular Sedimentation in the Ultracentrifuge

By THE SVEDBERG

(Abstracted from Endcavour, Vol. 6, April 1947, p. 89)

THE sedimentation of particles of molecular dimensions can be experimentally observed if the equivalent of an intense gravitational field is produced by centrifugal force. The necessary conditions can be created in an apparatus known as the ultracentrifuge. The latter has proved particularly useful in the study of the homogeneity of proteins and the determination of their molecular weights. The technique has also been successfully used in the study of other natural and synthetic polymers such as cellulose rubber, and polyethylenes.

The Spectroscopy of Flames

By R. F. BARROW

(Abstracted from Endcavour, Vol. 6, April 1947, p. 85)

FLAME SPECTRA are very complex, and it is only since the development of quantum theory that substantial progress towards their clucidation has become possible. Difficulties may arise owing to the necessity for distinguishing between chemiluminescent and thermal phenomena. Dr. Barrow here reviews recent work, and makes the interesting point that chemiluminescence may in the future have an important part to play in lighting systems.

Some Physical Instruments used in Medicine

By D. S. EVANS

(Abstracted from Endeavour, Vol. 6, April 1947, p. 69)

CHEMISTRY has always found manifold applications in medicine, and was indeed, in the days of iatrochemistry, merely the physician's Abigail. At the present time chemotherapy basks in the glory of such discoveries as penicillin, the sulphonamide drugs, and paludrine. The applications of physics to medicine have so far lagged behind, except in such cases as the use of x-rays and radioactivity in diagnosis and treatment. The many recent advances, however, leave no doubt that physicotherapy has as bright a future as chemotherapy. as chemotherapy.

Penicillin in Purification of Smallpox Vaccine

By C. DIAZ ROMERO

(From the Archivos Soc. Biol. Montevideo, Vol. 12, June-September 1945, p. 152, as abstracted in the Bulletin of Hygiene, Vol. 21, November 1946, p. 721)

DIAZ ROMERO vaccinated against smallpox a group of non-vaccinated persons in the course of penicillin therapy for syphilis. The therapy consisted in daily administration of 100,000 Oxford Units for ten consecutive days. Vaccination took normally. Revaccination several months later did not take. Lymph in vitro was prepared by the addition of penicillin in

quantities varying between 300 and 600 units for 1 gm. of lymph. It reduced the number of secondary bacteria. The number of secondary bacteria in the lymph had diminished still more by the end of two months. The author concludes that penicillin does not interfere with the effect of vaccine virus both in vivo and in vitro and that it reduces the number of secondary bacteria in vaccine lymph.

The Diagnosis and Management of Spontaneous Hypoglycæmia

By JERDOME W. CONN

(Abstracted from the Journal of the American Medical Association, Vol. 134, 10th May, 1947, p. 130)

Three of the entire group of causes are responsible for over 80 per cent of all cases of spontaneous hypoglycæmia. They consist of (1) functional hyperinsulinism, (2) organic hyperinsulinism, and (3) hepatogenic hypoglycæmia. All the other known causes of spontaneous hypoglycæmia occur relatively infrequently and fortunately are associated with other clinical observations which usually disclose the ætiologic factor as for example in cases of Addison's disease, Simmonds' disease, severe renal glycosuria, lactation, partial or total gastrectomy and severe inanition.

In the differentiation of functional hyperinsulinism, organic hyperinsulinism and hepatogenic hypoglycæmia the following guides are of greatest value: (1) the level of the fasting blood sugar, (a) on normal carbohydrate feeding, and (b) on restriction of dietary carbohydrate or after a short fasting period; (2) the dextrose tolerance curve after a standard dietary preparation; (3) the results of several tests of liver function, and (4) the history and clinical course of the disturbance. The table summarizes the usual distinguishing points in the various types of spontaneous hypoglycæmia.

Functional hyperinsulinism

This type of spontaneous hypoglycæmia is by far the most commonly encountered. It accounts for at least 70 per cent of all cases of spontaneous hypoglycæmia. Although there is considerable difference of opinion as to what this syndrome should be called, all agree on two points: (1) It represents a disturbance in the nervous regulation of the blood sugar level (vegetative nervous system): this particular abnormality in the finer neural adjustment of the blood sugar level manifests itself in the form of postprandial hypoglycæmia under specific circumstances (following meals average or high in carbohydrate when there concomitantly exist conditions of high physical and/or emotional tension) and does not produce hyperglycæmia. (2) A diet high in protein and low in carbohydrate (all other things remaining the same) effectively stabilizes the blood sugar and abolishes the postprandial 'dips' which are responsible for the symptoms.

Organic hyperinsulinism

Indications for Exploration of the Pancreas: The clinical and laboratory characteristics conform to those outlined in the table and afford a clear indication for exploration of the pancreas. When such criteria are satisfied one can predict the presence of a pancreatic insuloma in virtually all cases. It must be emphasized, however that these criteria are severe and that an occasional early case may fail to satisfy them. Since the characteristic course of the disease is one of progression, such a case will eventually give the typical findings.

such a case will eventually give the typical findings. When the diagnostic criteria for organic hyperinsulinism have been satisfied surgical treatment is indicated and should be urged. Medical management of these cases is notoriously unsuccessful. While in the early stages of this syndrome dietary management may afford temporary relief, the disturbance soon progresses to a point where such efforts are in vain. In cases in which operative intervention is refused a worthwhile temporary expedient is the use of epinephrine in oil (1 mg. subcutaneously twice a day).

TABLE
The usual points of distinction in types of spontaneous hypoglycomia

	The asual points of distin	οιιοπ τη τυριές οι			
	,		Fasting B	Dextrose tolerance	
Liver function	Clinical course (progression and time of attacks)	Туре	Standard diet	Carbohydrate restriction or 24-hour fast	curve (after standard dietary prep.)
Normal	Not progressive in severity; more frequent under emotional or physical tension: relief by vacations, etc.: attacks 2 to 4 hours after meals; no prebreakfast attacks: no effect of skipped or late breakfast.	hyperinsulinism.	Normal	Normal*	Normal fasting blood sugar (sharp fall to hypoglycæmic levels between 2nd and 4th hour).
Normal	Progressive in frequency and severity: prebreakfast attacks frequent, 2 to 8 a.m.: attacks 2 to 4 hours after meals: attacks precipitated by skipped or late meals or exercise.	Organic hyperinsulinism.	Subnormal (usually below 50 mg./100 c.c.)	Subnormal (always below 40 mg/100 c.c., usually below 30 mg./100 c.c.).	Subnormal fasting blood sugar (low level curve; sharp fall to severely low levels between 2nd and 5th hour).
Usually decidedly diminished.	Progressive in frequency and severity: prebreakfast the time of most frequent occurrence, 2 to 8 a.m.: daytime attacks rare unless precipitated by a skipped meal: sometimes clinical evidence of hepatic disease.	Hepatogenic hypoglycæmia.	Subnormal (often below 50 mg./100 c.c.).	Subnormal (always below 40 mg./100 c.c., often below 30 mg./100 c.c.).	Subnormal fasting blood sugar hyper- glycæmic plateau curve with glyco- suria; gradual fall to hypoglycæmic levels in 4 to 7 hours).

^{*}During three days of severe carbohydrate restriction most normal persons show fasting blood sugar levels of 50 to 60 mg. per hundred cubic centimetres.

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Viburnum	 • •	 5.0 ,, ,,	Ext. Hyoscyamus	Sic.	1½ gr. per dose.
		10.0 ,, ,,	Spirit	••	9.0 per cent proof.
			Vitamins		B, C, E & G.
Coriander			Syrup ar	id Fla	ivouring agents.

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Hepatogenic hypoglycamia

Hepatogenic hypoglycemia is the result of diffuse degenerative changes in the parenchyma of the liver. In acute degenerative lesions of toxic origin (carbon In acute degenerative lesions of toxic origin (carbon tetrachloride, cinchophen, hydrazine and smoke) the administration of large amounts of carbohydrate and protein by mouth or parenterally (as dextrose and amino acids) is indicated. If the hepatitis does not prove fatal, the hypoglycemia will have been only temporary, and complete restoration of the function of the liver with respect to blood sugar regulation is likely. In chronic, progressive, destructive and degenerative lesions of the liver the attending hypoglycemia (when present) can be controlled only by preventing long intervals without food. A high carbohydrate, high protein diet arranged to include a meal before retiring at night will wearly control the bypoglycemia which at night will usually control the hypoglycemia, which almost always occurs before breakfast.

In a small group of cases of hepatogenic hypogly-cæmia in which the hepatitis is due to an ascending cæmia in which the nepatitis is due to an ascending infection of the biliary tract, removal of the source of the hepatitis (gallbladder) may allow sufficient restoration of hepatic function to completely overcome the hypoglycæmic syndrome.

Electrolyte Loss in Dehydration

(From the Journal of the American Medical Association, Vol. 135, 1947, p. 356)

DARROW and his associates at Yale, and for a period in Texas, have approached the problem of biochemical in lexas, nave approached the problem of blochemical change in dehydration. This problem arose from the appalling mortality associated with infant diarrhea. In his William Buchanan Lecture, Darrow emphasizes dehydration as the chief clinical feature of infant diarrhea and goes on to show that the dehydration is accompanied, with approached classical diarrhea. accompanied with unsuspected electrolyte Particularly important is the discovery of the magnitude of the loss of potassium from the cells of the body. This loss results in a series of secondary physiologic disturbances which may result in severe complications or death. It is not enough merely to attempt to restore water in dehydration. Careful attention must be paid to the disturbance in electrolyte balance, and fluid must be administered in such a way as to restore the electrolyte balance along with the water balance. The balance of electrolytes may be a prime factor in food intolerance. Darrow recommends a solution composed of 4.4 gm. of sodium bicarbonate per litre, 2.7 gm. of potassium chloride per litre and 3 gm. of sodium chloride per litre. This solution contains more bicarbonate than serum, but less sodium and about the same amount of chloride. The potassium concentration, however, is almost ten times that found in serum. This solution may be administered by continuous intravenous drip diluted in the ratio of 1 part to 2 parts of 5 or 10 per cent dextrose. The injection rate in infants should be at the rate of about 80 to 100 c.c. per kilogram during the first twentyfour hours. The mortality from infant diarrhea has been greatly reduced by this treatment. These observations suggest the importance of a study to determine whether or not similar shifts in potassium occur in cases of dehydration associated with surgery. Among other problems associated with dehydration and electrolyte disturbances there may be an effect on enzyme systems.

Reviews

ON THE CONTRIBUTION OF CLINICAL STUDY TO THE PHYSIOLOGY OF THE CEREBRAL MOTOR CORTEX (THE VECTOR HORSLEY MEMORIAL LECTURE—27TH NOVEMBER, 1946).—By F. M. R. Walshe, M.D., D.Sc., F.R.C.P., F.R.S., Hon.D.Sc. (Nat. Univ., Iroland). 1947. Pub-lished by E. and S. Livingstone Ltd., Edinburgh. Pp. 31. Price, 1s. 6d. Postage, 1d. (home)

This lecture is an excellent piece of masterly survey of seventy-five years of investigation of the cerebral motor cortex. The lecturer, himself a master-mind on the subject in devotion to the memory of a past master-mind on the theme, has presented in a most convincing way the correlation of experimental and clinical study of motor cortex. The author's passionate interest in the relation of general principles 'passionate interest in the relation of general particulars to facts' has led to his unique success in presenting to his audience on the background of analytical discussions on 'the clinical study', 'the discharging lesion' and 'the destroying lesion' the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts are solved to the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one, localization of the signal facts that the so-called motor cortex is a sensorimotor one of the signal facts that the so-called motor cortex is a sensorimotor one of the signal facts that the signa tions on the motor cortex are of movements and not of muscles, cortical representations of movements are multiple and cortical representation is in a perpetual flux. The lecture is not merely a statement of 'things seen, but rather of the intellectual endeavour that has gone to make of them a signal addition to science'.

TEXTBOOK OF OBSTETRICS.—By G. I. Strachan, M.D., M.R.C.P., F.R.C.S., F.R.C.O.G. 1947. H. K. Lewis and Company, Limited, London. Pp. xi plus 731, with 3 coloured plates and 323 illustrations In the text. Price, 45s.

This is yet another textbook on obstetrics incorporating the principles of obstetrics as practised in Great Britain. It contains the usual chapters on the anatomy and physiology of reproduction, normal reproduction, the new-born child, the pathology of reproduction, complicated pregnancy, obstetrical production of the pathology of reproduction of the pathology reproduction, complicated pregnancy, obstetrical operations, and so on. The information given is up to date. The description is in plain language and incorporates all that is necessary for a beginner in this speciality. The author says the book is primarily intended for the undergraduate. This purpose has been amply served. It will not however be prized by the specialist who may need authoritative information about the latest developments. This latter the book does not profess to contain.

It is difficult to single out any chapter or section for special praise or criticism. The last chapter on blood transfusion in obstetric practice will be particularly appreciated. Toxemias of pregnancy merit a little bit more detailed treatment than has been recorded to them. A few references to figures been accorded to them. A few references to figures have to be corrected. As an example, on page 447 reference has been made to an episiotomy incision—but figure 304 (showing upper segment Casarean section) has been wrongly quoted. There are a few such printer's errors

which may have to be revised.

The printing and the get-up are in keeping with the best traditions of the publishers Messis. H. K. Lewis and Company of London.

M. S.

PROGRESS IN GYNÆCOLOGY.-Edited by Joe V. Meigs, M.D., and Somers H. Sturgis, M.D. 1947. William Heinemann (Medical Books) Limited, London. Pp. xiii plus 552. Illustrated. Price, 35s.

This book is intended to summarize recent advances of various branches of gynæcology for the purpose of refreshing and bringing up to date those medical men who have spent the last years in the Armed Forces of their country and who have been far removed from the practice of the Diseases of Women'.

The above object has been amply served. In addition to this success there are many others which the

book can justifiably claim. Chapters II, III and IV are of special value to post-graduates seeking information on these disputed topics. The subject-matter has been dealt with in a masterly fashion, giving the essential details, and omitting accounts of experiments and historical notes about the discussions. The gynærological methologist will appreciate the charter cological pathologist will appreciate the chapter on Malignant Growths. One feels interested about the discussion between the relation of 'Intra-epithelial Carcinoma' to 'Invasive Carcinoma of the Cervix'. It is decidedly a normal method of approach to a subject of everyday discussion.

The practical gynæcologist will be able to revise his operative technique in chapter IX. Nothing particularly modern has been included in this chapter. It will however help to refresh the memories of those who have long been out of touch with the subject. The technique of complete tear of the perineum has been elaborately described; that of the operation for stress incontinence of urine has been perfunctively dealt with. Perhaps the editors thought that this latter operation should be done only by the experienced man and not by the 'demobbed' surgeon.

The commercial preparations of endocrine products have been described in the chapter on Pre-operative and Post-operative Care. This combination is not understood. The discussion on the use of chemotherapy and penicillin in gynæcological practice is short. It is not in keeping with the general plan of the book, viz, the detailed account of the subject dealt with.

The binding and the printing are very good. Illustrations are not many, but where they are wanted as in the description of operative techniques they are in plenty and neatly executed. We welcome this book as an addition to the series of post-war symposiums on

gynæcology.

M. S.

ATLAS OF CARDIOVASCULAR DISEASES .-- By I. J. Treiger, M.D. 1947. The C. V. Mosby Company, St. Louis. Pp. 180, 69 plates and 244 illustrations, 11 in colour.

THE general plan of this book appears to be to present a precise picture of the commoner heart diseases by means of electro-cardiograms and x-ray pictures and correlating those with the clinical history and autopsy findings.

A cross section type of heart disease with autopsy

findings is thus presented.

The book is divided into 6 parts: Normal Heart Disease, Rheumatic Heart Disease, Arteriosclerotic Heart Disease, Hypertensive Heart Disease, Syphilitic Heart Disease and Congenital Anomalies.

Only simple uncomplicated cases are presented and an endeavour has been made to present cases with skiagram,

characteristic changes in the ski cardiogram and pathological specimen.

The author obviously has little use for measurements of size and does not mention any of the schemes for measuring the cardiac diameters. This is a pity as measurements, such as those of Vaquez and Bordet, are of considerable value in the differentiation of heart lesions. However, this does not detract from the value of the Atlas as far as it goes. To those who know, measurements have their own indications and they can be used conjointly with a book of this kind.

Throughout the volume the letterpress, reproduction of skiagrams and electro-cardiograms are excellent. The plates of pathological specimens, especially the

coloured ones, are very helpful.

The value of such a book of reference to the radiologist cannot be too highly stressed.

J. A. S.

BIOLOGICAL STANDARDIZATION OF THE VITA-MINS.—By Katherine H. Coward, D.Sc. Second Edition. 1947. Baillière, Tindall and Cox, London. Pp. vii plus 224. Illustrated. Price, 16s.

THE first edition of this book was published in 1938 and almost immediately came to be recognized as a

standard book for students and research workers. The reviewer recalls the tremendous help he received in organizing the first biological standardization laboratory in India from the most practical details contained in the first edition. The second edition of this useful book is therefore most welcome not only to those who are familiar with the first edition but also to others who will go through the pages for the first time. In lucidity of expression and in the presentation of statistical data to laboratory experimenters who are not always gifted with a mathematical trend of mind, this book will stand in a class by itself.

As in the first edition, the subject is divided into two parts, the first part giving details of assay of each vitamin and the second outlining the statistical method; employed in estimating the accuracy obtainable in such assays. In the first part, apart from many minor additions and alterations in the text in general, the most important addition is a chapter on the determination of vitamin E, the International Standard of Reference for which has since been adopted. The second part has come in for extensive changes and the statistical aspect is treated in the light of more modern concepts introduced by Irwin, Bliss, Fieller, etc Till recently the limits of error were calculated by a method now shown to be only approximate. The method of calculating both the approximate limit of errors as well as the true fiducal limits are given here. Examples illustrating these calculations have been given from the results of the author's work in her laboratory. The application of the statistical methods has been particularly helpful in determining whether any modification in techniques results in increased accuracy or if the duration of the tests can be reduced without materially affecting the accuracy. Dr. Coward has suggested many improvements in the technique of biological assays by modern methods of statistical examination of the experimental data collected for many years in her own laboratory. With the application of these statistical methods and by following the outlines of techniques in the biological assays for vitamins recorded in the earlier chapters of this book, it is now possible to give a great degree of precision to the experimental results, which are inherently only approximate in this type of bio-assays.

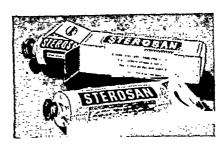
During recent years, more and more chemical and physical methods are being described for the accurace estimation of certain vitamins and the biological assays for such vitamins as B₁ and C are gradually being discarded in laboratories for routine examination purposes. As the chemical nature of the vitamins would be more accurately known, it is not unlikely that more and more physico-chemical tests would be evolved for the accurate estimation of the vitamins and biological assays will gradually recede in the background. Official pharmacopoial recognition has already been given to spectro-photometric determination of the vitamin A potency and similar findings may be recorded for vitamin D and others. However, this will not reduce the importance of biological assays which are after all the ultimate criteria of the effectiveness or otherwise of the utilization of vitamins in a biological mechanism. Dr. Coward has been one of the pioneers in this field and the clear and lucid way in which she has expressed a meet difficult subject is worthy of the has expressed a most difficult subject is worthy of the greatest praise.

The book, in the opinion of the reviewer, should be regarded as an essential practical guide for all workers interested in the biological standardization of medicinal and food products and for research workers in general.

RETROPUBIC URINARY SURGERY.—By Terence Millin, M.A., M.Ch. (Dublin), F.R.C.S., F.R.C.S.I. 1947. E. and S. Livingstone Limited, Edinburgh. Pp. vii plus 208. Illustrated. Price, 25s. Postage, 8d. (home)

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supported by practical experience and though its advantages are not generally accepted, it has a future which will weigh in its favour. The description of the which will weigh in its layour. The description of the operations, the illustrations, the difficulties and after-care are given lucidly. Recurrences after the accepted methods of operations have been investigated and these findings have strengthened the case for the retropubic route. This method will appeal to the younger urological surgeons and their experience and reports will add to its reputation of its superior results.

L. M. B.

INDUSTRIAL RESEARCH COUNCIL: MEDICAL HEALTH RESEARCH BOARD. REPORT NO. 90. 'THE INCIDENCE OF NEUROSIS AMONG FACTORY WORKERS.'—By Russell Frasor. 1947. Published by His Majesty's Stationery Office, London. Pp. 66. Illustrated. Price, 1s. 3d.

In the early years of the war there was evidence indicating that neurotic illness caused a considerable amount of absence from work, and it was feared that it might increase still further and prove a serious threat to industrial efficiency. Accordingly, in 1912, the Medical Research Council's Industrial Health Research Board initiated an investigation by a team under Dr. Russell Fraser to estimate the true incidence of neurosis among factory workers and its effects on production and to find out the factors predisposing to such illness. To this end over 3,000 workers were examined, being a random sample from a total population of 30,000 in 13 factories. Each individual was personally examined primarily towards the detection of neurosis, but data concerning his physical fitness, past health record and the environment in which he lived and worked were also collected. The main findings of the survey afford striking confirmation of the importance of psychological factors in attaining industrial efficiency. Over 25 per cent of all sickness absence was due to neurosis, and 10 per cent of the workers examined had suffered from disabling neurosis during the six months under review. It was also found that certain features in the life or environment of the individual workers were associated with a varying incidence of neurosis. These features are detailed in this report, and while they need confirmation by further investigation, they are revealing enough to show the need for welfare and social work and for adequate facilities for treatment of neurotic illness. Factory officials worried with under production will do well to read the report.

MODERN DEVELOPMENT OF CHEMOTHERAPY.—
By E. Havinga, H. W. Julius, H. Veldstra and
K. C. Winkler. 1946. (Monographs on the
Progress of Research in Holland.) Elsevier Publishing Company Limited, London. Pp. xi plus
175. Illustrated. Price, 15s.

This is one of a series of monographs on research work that was carried out in Holland during the war but could not be published earlier owing to German occupation. The volume deals with the work done on sulphonamide drugs, presenting the subject from bacteriological, chemical, pharmacological and clinical aspects. There is also a chapter on antibiotic substances. This research originated from the observation of Van Luite that micro-organisms from the soil of Van Luijte that micro-organisms from the soil, of Van Luijte that micro-organisms from the soil, particularly penicillum expanseum, are capable of producing substances antagonistic to plant parasites. The antibiotic factor, named 'Expansine', appears promising in certain skin conditions but has yet to be perfected. The extensive investigations carried out in the midst of adverse circumstances are a tribute to the the midst of adverse circumstances are a tribute to the patience and tenacity of the Dutch workers, especially as they were out of touch with fellow workers abroad and had to depend entirely on themselves.

THE DIAGNOSIS OF THE ACUTE ABDOMEN IN RHYME.—By ZETA. 1947. Published by H. K. Lowis and Company Limited, London. Pp. vii plus 88. Illustrated. Price, 5s. 6d.

This booklet sets out in plain rhyme the salient features of acute abdomen, covering the principal illnesses, viz, perforated ulcer, acute pancreatitis, appendicitis and cholecystitis, intestinal obstruction, colics, ectopic gestation and peritonitis. It is pleasant to read and enlivened with the author's personal experiences and humorous drawings which impress the memory. As he says, his aim is 'to amuse you while I try to teach', and as such, it will appeal to many students.

INTRODUCTION TO PHYSIOLOGY.—By W. H. Nowton, D.Sc., M.D. First Edition. 1948. Edward Arnold and Co., London. Pp. 284, with 113 illustrations. Price, 7s. 6d. net

THE author is commendably successful in approaching and catering fundamental physiological ideas in a lucid language cautiously avoiding intricate technical details. The facts stated in this handy volume have been supported by 113 neat sketches. The book will be very useful to young learners.

In view of the price, the get-up and printing are good but a few printing mistakes have crept in here

and there.

P. D.

ATLAS OF HISTOPATHOLOGY OF THE SKIN .-- By G. H. Percival, M.D., Ph.D., F.R.C.P.E., D.P.H., A. Murray Drennan, M.D., F.R.C.P.E., F.R.S.E., and T. C. Dodds, F.I.M.L.T., F.I.B.P., F.R.P.S. 1947. E. and S. Livingstone, Limited, Edinburgh. Pp. vili plus 494. Illustrated with 376 photomicrographs Price, 75s. Postage, 7d. (home) in colour.

This excellent publication gives, in 376 photomicrographs in colour, all one sees under the microscope, in sections and smears of the diseased skin.

A clinical classification has been adopted in grouping the lesions according to the type of cutaneous reactions, not according to the etiology. A brief general description of the groups is available.

Hæmalum and eosin are the stains employed in most of the preparations although special stains are not

ignored.

The legends are lucid and brief, and diagnostic features up to date.

The work provides more information to the pathologist than to the dermatologist who usually recognizes the lesion by sight and feel. Some subtleties in diagnosis, however, may be settled between the two by the aid of this book.

The get-up is good and price reasonable.

SYNOPSIS OF ALLERGY.—By Harry L. Alexander, A.B., M.D. Second Edition. 1947. The C. V. Mosby Company, St. Louis. Pp. 255. Illustrated. Price, \$3.50

This little book supplies the latest information on allergy, such as antihistamine drugs, vascular allergy, sensitization to drugs, chemical and physical agents leading to allergy, and intrinsic atrophy.

The sections on bronchial asthma and dermatoses are particularly informative. The connection between lymphogranuloma inguinale and periarteritis nodosa points to other similar links in infection generally.

Tests for allergy, appropriate diets and medicinal treatment are adequate. Extensive surgery like Caldwell-Luc operation for nasal condition is perhaps over-emphasized.

The paper, printing and binding are good. Only one printing error has attracted the reviewer's attention: on page 97, last para, line 10, 'lipidol' should be 'lipidol'. (2) that many tropical conditions give rise to a false positive WR, \pm in the tropics must remain equal to doubtful, significant in cases of syphilis and insignificant in others.—Entrop. I.M.G.1

Second letter

I agree with you that incubation period of the disease in 85 out of 662 cases could be disputed as it was recorded as 10 days or less. This observation was based on the patients' statements. They may have deliberately given a wrong date of the last exposure or the infection may have taken place at an exposure previous to the last one.

This however should not convey an impression that we labelled cases as seronegative primary syphilis without seeing Treponema pallidum in the primary lesions. Please refer to para 3 of my article (p. 563). It is clearly stated there that 161 out of 662 cases showed Treponema pallidum. Twenty-two out of these 161 were seronegative. The remaining 501 cases did not show Treponema pallidum and were diagnosed on serological and clinical evidence. Your footnote 'the correct designation of such a reaction is doubtful' refers to one of these 22 cases who showed Treponema pallidum but were serologically negative. Incubation period of this particular case was 20 days. If you had stated that correct designation was positive and not weakly positive as mentioned in para 1 of your letter, strictly speaking, you would have been justified. But I may add that the technique of the test practised in Indian army serological laboratories as well as the recording of its results is not done strictly according to Wyler's modification as per M.R.C. special report series 129; the alterations however are so minor in nature that I considered the simplest way of giving an idea of the technique to the civilian workers in India and to workers in other parts of the world was to call that Wyler's modification.

Yours, etc., Major BALBIR SINGH.

['Uncritical nature of the record in respect of history is apparent. If the case was really Treponema positive, with appropriate incubation period the interpretation of ± according to Wyler, should be positive, not weakly positive. According to Indian experience it should be "doubtful, significant".

The author makes no observation on Indian experience. WR problems in India are different from those in the West. Even in the West old ideas on WR are being revised.

The following extract will be of interest in this connection: "Most people would read a WR as doubtful if there were partial hæmolysis in the tube containing 3 MHD of complement". T. E. Ormond, Bulletin of Hygiene, 23, 26th January, 1948'.— Editor, I.M.G.]

Any Questions

INTRAVENOUS GLUCOSE

Sir,—Glucose injections are given intravenous and intramuscular even when the patient can retain and take glucose by mouth.

What is the rationale of this therapy? Besides having a food value has it any detoxicating properties in toxemia of typhoid or pneumonia?

Kindly discuss the therapeutics of glucose injections.

Yours truly, M. C. SATYANARAYANA, M.B.B.S. IGlucose injections are too often given without sufficient justification, but the subject cannot be discussed in detail here, and only a brief account is given.

Its main value is as a ready source of energy to the body. When large quantities are given parenterally, the caloric value of the sugar may be significant in individuals who can take little or none by the mouth. It is a convenient and often valuable method of supplying water for dehydration and thus combating shock. It is also useful in the treatment of ketosis. It should be noted that when there is depletion of electrolytes as in vomiting and diabetic acidosis, sugar solutions do not suffice and suitable salts must be administered. As is well known, it is the most effective method of alleviating hypoglycæmia. In states of malnutrition and in acute infections, viz, typhoid, in which the glycogen reserves of the liver have been depleted, the administration of glucose tends to replenish stores and thus probably improves hepatic function and protects the liver from further damage; but for maximum effect proteins of the right kind must also be supplied. Similarly it has protective action against a variety of toxic agents, e.g. arsenic, chloroform, etc. Glucose infusions are often followed by increase in urinary volume and in 50 per cent strength it reduces intracranial pressure by osmosis, but the effect is transitory.

Five per cent glucose solution is approximately isotonic with blood and this is the strength most often used for intravenous therapy.—R. N. C.J

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The Indian Medical Gazette

TRAGEDY NUMBER

A TRACEDY the like of which had not shocked the world for 1,915 years enveloped India in gloom on the 30th January, 1948! Medical men are affected like other men. Medical India mourns.

The Indian Medical Gazette is bringing out a special number in two months' time. Contributions are invited on all subjects which mitigate suffering and thus would have found favour with the Mahatma.

The following subjects are suggested:-

Psychology of lesser men, men and supermen.

Social fabric, population pressure, poverty and misery.

Crime and punishment. The irresistible impulse.

Juvenile and senile delinquencies.

Capital punishment.

Hanging as capital punishment.
Shooting as capital punishment.
Preservation of human dignity and liquidation of unwanted life.

Euthanasia.

Operation for abortion. Killing and callousness. 12.

Humane slaughter.

Food, gluttony and fasting. Stimulating drugs, their use and abuse. 15.

Beverages, intemperance and prohibition.

The present system of education in general and medical

education in particular.

18. Span of human life.

Contributions are not limited to medical men only: Veterinary sur-geons, missionaries, lawyers, educa-tionists and social workers are also contributing.

Original Articles-

TREATMENT OF LICHEN PLANUS*

A REPORT OF 12 CASES TREATED BY IMMUNIZATION THERAPY

By SHARAT C. DESAI, M.D.

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LICHEN PLANUS is described by certain authors as an inflammatory disease of acute, subacute, or chronic nature (Sutton and Sutton. 1939; Andrews, 1946). There have been various theories regarding its ætiology, viz, microbic, nervous, constitutional, toxic, septic, and infectious. The acute variety of lichen planus is associated with mild or severe constitutional reactions and showers of typical papular eruptions involving the whole body in 24 to 48 hours. Besides, it is known to involve the mucosæ, sclera, the conjunctiva (Michelson and Laymon, 1938), and even gastric mucosa (Chevallier and Moutier, 1936). The evolution of subacute and chronic type of the disease is also of a systemic nature in majority of cases. All the above findings indicate that lichen planus is a systemic disease. Fordyce (1910), Montgomery and Alderson (1909), and others hold the same view. The pathological changes in the corium, viz, hypertrophic papillæ, dilatation of blood vessels in the papillæ and corium, and intense inflammatory type of exudate containing the lymphocytes, and even polymorphonuclear cells in acute lesions, formation of bullæ in severe acute cases, besides connective tissue proliferation, possibly indicate an inflammatory ætiology. There have been various agents blamed as the cause of this inflammation, viz, a spirochæte [Hazen (Sutton and Sutton, 1939)], a bacillus [Jacob and Helmbold (Sutton and Sutton, 1939)], and a virus [Darier, Lipsschutz (Klaar and Rosner, 1924), Kogoj (1928), Biberstein and Wachtel, (1946)].

Biberstein and Wachtel (1946) reported promising results in the treatment of 39 cases of lichen planus by immunization therapy. They base this approach on the virus ætiology, and on success of immunization therapy in other virus diseases like verruca vulgaris and condyloma acuminata in human beings, and papillomatosis in cows and horses. Biberstein also reported successful results by the same method in lichen planus in 9 out of 13 cases in 1932, after which much work has not been done on the same lines. Besides the above two papers covering about 50 cases in all, and with more

than 70 per cent of patients deriving benefit by this treatment, there had been no other attempts in the same direction to my knowledge. The present series of 12 cases, although very small for statistical evaluation, is reported now to enthuse more workers in India on the same line, as I find that this disease is on the increase. All the cases were exclusively treated by the autolysate only, unless otherwise stated.

Preparation of the autolysate.—The autolysate was prepared by Dr. L. Monteiro of the Department of Pathology, Seth G. S. Medical College, according to the method reported by Biberstein

and Wachtel (1946) (vide Appendix).

The dosage.—The writer departed from the dosage advocated by Biberstein (0.2 c.c. intradermally twice a week), and injected in a gradually increasing dose, starting with 0.2 c.c. intradermally and increasing by 0.2 c.c., up to a maximum dose of 1 c.c. given in three or four different places. This dose was repeated subsequently. Injections were given twice a week. The deviation from the dose as advocated by Biberstein was based on the experience in other immunotherapy by vaccines, where the latter are given in increasing doses to build up the immunity.

The type of cases treated.—Out of 12 cases, 11 were males and 1 female. The age incidence was from 12 to 45 years, and the duration of the disease from 20 days to one year. The clinical types of the disease were as follows:—

- 1. Lichen planus hypertrophicus .. 8 cases
- 2. Lichen planus verrucosus with 1 case nodular masses (see figures 1 and 2, plate X).
- 3. Lichen planus linearis 1 "
- 4. Lichen ruber planus with fixed 1, pigmented areas on the nose and below the eye lid.
- 5. Lichen planus obtusus .. 1 "

All the cases of lichen planus hypertrophicus were of a generalized nature with hypertrophic plaques mainly on the lower extremities besides typical lichen planus papules. Histopathological sections were examined in majority of cases and clinical diagnosis was confirmed.

A table showing the summary of all cases

treated is appended herewith (table I).

Special clinical features of some cases.—Most of the cases of hypertrophic type had one or more hypertrophic, irregular, warty lesions mainly on the lower extremities, besides usual lesions. The hypertrophic patch in some cases preceded the systemic evolution of the disease by months. The distribution in this variety favoured extremities more than the trunk.

One case, classed separately in table I, was peculiar in the size of the lesions. The lesions were nodules varying from 1 to 2.5 cm. in diameters, and wart-like. The photographs (see figures 1 to 6, plates X and XI) of the patient are reproduced. The distribution is again centripetal. This case cleared up entirely in a short time without any remnants.

^{*}A paper read at the First All-India Conference of Dermatologists and Venereologists at Bombay in December 1947.

Table I
Summary of all treated cases

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Patient number	Туре	Age	Duration of disease	Relief of itching	Subsidence of lesions	Final result
1	Verrucous nodular	35	3 months	3rd injection, arms and trunk. 8th injection, all over.	Started 3rd injection, All cleared 8th injection,	Cured. No recurrence for 3½ months afterwards.
2	Hypertrophic plaques and typical lesions.	38	2 months	3rd injection, arms and trunk. 10th injection below waist.	Started 11th. All cleared 12th injection.	Cured. No recurrence for 1 year. Recurred after 1 year. Again 75 per cent cleared by autolysate. No effect of
3	Hypertrophic plaques, lower extremities. Typical lesions all over.	45	1½ months	3rd injection, arms and waist. 12 injec- tions below waist, persisting 25 per cent of previous intensity.	started. 8th injection all clear.	B complex. Cured. No recurrence for 4 months' observation. B complex for relief of persisting itching. Benefited.
4	Hypertrophic plaques, legs. Typical lesions upper extremities.	30	1 year	2nd injection, arms and waist. 4th in- jection complete relief.	started. 10th injection all flat except indolent plaque	Bismuth 5 injections given for the remnant patch. No change. Lost before complete relief.
	Hypertrophic plaque on legs, Few plaques and papules in arms.		2 months	completely relieved.	10 injections	Cured. Lost from fur- ther observation.
6	Dome-shaped papules on thighs (obtusus).	1	2 months. Previous attack	2nd injection. 6th injection complete relief.	No change	Lesions did not subside. Itching subsided. 10 injections given. Lost
	Hypertrophic plaques on legs and abdomen. Papules on upper extremities.		1932, 6 months	3rd injection relief begins. 7th injec- tion complete relief.	started All	from observation. Cured. Previously had taken 5 injections of bismuth and B complex with only 10 per cent
	Few hypertrophic plaques in legs. Rest of lesions typical papules.	39	1	3rd injection sub- siding. 5th injec- tion relief up to waist. 10 injections complete relief.	4th injection started. All	relief. Cured. Lost from observation. Previously treated at Lucknow without relief by some
	Hypertrophic plaques on lower extremities. Shower of papules on upper extremities.	12	1	3rd injection relief started on upper extremities.	Flattening started after 6th injection.	injections. Advised B complex injections after. Improving. Lost from observation.
10	Same as 9	16 [2	2 months	Relief on trunk 4th		Took furnis 1
]	Linear lesions on upper arm.	22 '	15 days	injection. No itching to start with.		Lost from observation. Left treatment. 6 injections given with-
·	Fixed pigmented areas with fine papules on nose and left cheek. Shower of small papules on upper arm.]	8 months (pigment). 10 days' lesion on arms.	No itching to start with.	••	out any change. Lost from observation. 16 injections given with- out relief. Injection bis- muth and B complex started. Gradual sub- sidence after further 2 months.

Out of the remaining cases, only two require special mention. One case had a fixed violaceous pigmented patch with minute papules on the alæ of the nose and below the left eye; subsequently he developed showers of typical lichen planus papules in the upper extremity. The lesions on the face are rare in lichen planus and more so on the nose. The last case (lichen planus obtusus) had dome-shaped, black papules on the inner surface of thighs, and occasional similar lesion on the upper extremities. There were no typical papules. The lesions were

intensely itching. He had the same disorder seven years ago and was treated with mercury-arsenic injections (Enesol).

Results.—Results are considered under four headings, viz:

- (1) Relief of itching,
- (2) Subsidence of lesions,
- (3) Subsidence of pigmentation, and
- (4) Freedom from recurrences, these being the dominating features of the disease.

Relief of itching.—The treatment was found to be the most satisfactory measure up to date for the relief of this distressing symptom, which, when present, is the patient's main worry. This was also the first change under treatment. In two cases, nos. 11 and 12, there was no itching to start with; in the remaining, the itching subsided with second to fourth injection, and completely relieved on the upper extremities and trunk by eighth to tenth injection. It, however, took a longer time to subside on the lower extremities although it became less in intensity and duration of the attack. The relief on the lower extremities was assessed by most patients at 50 to 75 per cent. In fact it was surprising uniformly majority of the patients volunteered the information that itching was persistent in cyclical attacks below the waist, while it was completely relieved above. This peculiarity was also noted by Biberstein. It was also seen that the subsidence of lesions followed relief of itching although not necessarily so in all cases. In five cases in this series the itching persisted although of diminished intensity on the lower extremities for more than one month and up to two months, while in the remainder it completely subsided within one month. In the former group injections of vitamin B complex containing high doses of vitamin B₁ (50 mg.) were employed as a subsidiary therapy for the remainder of itching. It seemed to be helpful to some extent, in occasional cases, although not instantaneously or uniformly.

Subsidence of lesions.—This usually followed the relief of itching, particularly on the upper extremities and trunk. The lesions on the lower extremities were mainly hypertrophic plaques besides the usual typical papules in 8 cases, and began to subside even without relief of itching in some cases. In six cases, the lesions completely subsided, flush with the skin in one to two months' time. The flattening of lesions commenced with third to fourth injection and was completed with 8th to 16th injection. change seemed to be more pronounced in subacute verrucous and hypertrophic varieties of the disease excepting one case. In the latter there was a hypertrophic verrucous chronic indolent plaque of more than one year's duration which was resistant to treatment, even though the rest of the lesions on the body had cleared up. In one case of large nodular verrucous masses of the size of betel-nuts of (see photographs), generalized distribution which I considered beyond relief, the change was marvellous. All the lesions cleared up within one month, and the patient was completely free from all manifestations of the disease excepting residual pigmentation for a period of 4 months' Two cases, although observation. improving satisfactorily, were lost from observation for final assessment. The remaining three cases which did not respond to this treatment included one case of lichen planus linearis, one

of acute lichen ruber planus with fixed pigmentations, and one of lichen planus obtusus.

Disappearance of pigmentation.—In all the cases residual pigmentation remained when they were under observation for a maximum period of 4½ months. In one case, which is still under observation for more than one year, much of the pigment has gradually disappeared, the relief being assessed as 95 per cent by the patient. Evidently, pigmentary disturbances take a longer time to subside.

Recurrences.—Only one case has come again with a relapse after one year. The recurrence is again on the same areas on the legs where hypertrophic plaques were present and is again of the same type. It was associated with intense itching, due to which there was even bleeding on the scratch marks. There were no other lesions on the body. He was given injections of vitamin B complex daily to see if there was any relief by this procedure. It was tried for ten days without any results and finally autolysate was prepared from one of the lesions. Itching began to subside again by the third injection, and plaques are flattened by about 75 per cent up to date. The patient is still under observa-tion and treatment. This case brings out two important points, viz, the same therapy may prove useful again, the effect being almost specific, and relapse may occur in some cases. In this case there was no effect of B complex None of the other cases have come therapy. back to report after their initial attack was relieved.

Final assessment.—Out of twelve cases treated by this method, six were cured completely without any remnant of this disease. Two cases were lost from observation although they were improving satisfactorily when last seen. In one case all the lesions had disappeared excepting one indolent patch on the leg. All the above cases had hypertrophic or verrucous lesions. Of the nine above cases, eight were lichen planus hypertrophicus and one lichen planus verrucosus with nodular masses. Three cases did not improve and their types have been mentioned previously.

The number of injections given in cured cases varied from the minimum of 8 to a maximum of 16 and the total period under treatment varied from one month to two months.

The series is undoubtedly too short for comparison, but it is noted that gradually increasing doses of the autolysate might give better results in shorter periods of treatments than those reported by Biberstein and Wachtel.

In conclusion the treatment is a valuable addition to the therapy of lichen planus for two reasons: (1) relief of itching; and (2) substantial benefit particularly in hypertrophic and verrucous types of the disease, which are usually more resistant.

I express my gratitude to my chief Dr. J. A. Fernandez for permitting me the clinical facilities for this study, the Dean, K. E. M. Hospital, for allowing

the publication of case reports, my Registrar Dr. T. K. Mehta and various house-men who co-operated during the above work and lastly some of the patients who satisfied my curiosity by attending when called upon by letters after they were cured.

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Discussion

Mosby Co., St. Louis.

 $Dr.\ H.\ A.\ Maniar:$ Asked whether any local treatment was given. He narrated his experiences of vitamin B_1 100 mg. daily and ultra-

violet rays therapy giving good results.

Dr. Govind Nair and Dr. T. Venkateshan:
Gave their experiences with various other

treatments.

SUTTON,

Dr. A. Carvalho: Mentioned about the spontaneous remissions in the disease which should be considered in the assessment of the treatment.

The speaker replying thanked the audience for the discussion and mentioned that no final claim was made about the treatment, except that this method was found to be helpful with the two qualifications which appear last in this paper.

APPENDIX

Preparation of lichen planus lysate

The lysate for the treatment of lichen planus was prepared as follows from lichen planus tissue in which the virus was assumed to be

Papular or hypertrophic lesions, cleansed with alcohol and ether, were anæsthetized with procaine hydrochloride and epinephrine hydrochloride by subcutaneous injection and removed with a sharp spoon or a curet. The borders between the lichen planus infiltration and the normal tissue of the cutis were easily felt, so that any deeper injury to the cutis was avoided. The erosions healed within ten to fourteen days with the use of a mild salve (e.g. boric acid ointment or bismuth subgallate-zinc oxide paste).

The scrapings were cut into small pieces with scissors and ground in a mortar with isotonic solution of sodium chloride until a pulp resulted. Approximately 3 parts of the solution were added to 1 part of solid particles. The pulp was kept at room temperature for twenty-four hours and then placed into a water bath at a temperature

of 56 to 60°C. for sterilization for two hours. After bacteriologic sterility tests in liquid and on solid media (no growth seen) the suspension was filtered through sterile gauze in order to remove particles which would not pass through a needle. Phenol was added as a preservative (0.5 per cent).

As explained in a previous paper, this procedure seems to kill the hypothetic virus, and from the use of an antigen as described, we have yet to observe any effect which could be ascribed to the inoculation of a still virulent germ or virus.

STUDIES ON RINGWORM

FUNGUS DISEASES OF THE NAILS AND THE SURROUNDING TISSUES

By L. M. GHOSH D. PANJA

and

N. C. DEY

(School of Tropical Medicine, Calcutta) Financed by the Indian Research Fund Association

This is a report on the investigation of the diseases of the nails and the surrounding tissues caused by fungus infections. The investigation was confined to the isolation and study of the fungi present in the lesions, which are presumably the causative organisms of the diseases of the nails and the tissues immediately surrounding them, causing perionychia. Only those cases were selected in which the fungus infection was obvious or strongly suspected. Cases psoriasis, syphilis and dystrophy of the nails due to systemic diseases were as far as possible eliminated.

Method of study.—In each case the scrapings were taken from the nails and the surrounding tissues where involved. The scrapings were examined microscopically for fungus and simultaneously cultures were put up. The cultures were put up mainly in the Sabouraud's maltose peptone agar and also in the same medium with the addition of the gentian violet solution (1 to 400,000) to prevent secondary contamination. The addition of the dye proved to be of considerable value in preventing contamination although the primary growth was delayed by a day or two.

Identification.—For identification the following methods were used. In case of the dermatophytes or fungi of the ringworm group; solid media were used for the study of the giant colonies, the character of the growth, the colour variation, duvet formation and the character of the aerial hyphæ. The media found suitable for this study were the Sabouraud's proof media, glucose agar and the natural media like the wheat, barley and oat. The formation of the reproductive organs and special end organs was studied in welled-slide preparations in which the viscid media were used. Of the various media tried, such as glucose agar, Sabouraud's maltose peptone agar, etc., wheat-starch water and rice water gave more satisfactory results.

Total number of cases studied—256.

Number of cases giving positive results—212. Number of cases giving negative results—44.

These were divided into two groups.

Group I: Diseases of the nails only.—In this group the microscopic examination of the scrapings gave a quicker result for the diagnosis of the condition. Sodium sulphide solution was used as the keratolytic and cleaning agent.

The finding in this group was as follows:—

Total number of cases—209.

Number of positive findings, i.e. lesions caused

by fungus infection-190.

Number of negative findings in which the condition proved to be not due to any fungus infection—19.

The table below gives the details.

Of the 22 positive findings, 5 cases were of Actinomyces keratolytica and the remaining 17 cases were of monilia infection.

The 25 negative cases were:

Syphilis	 2
Tuberculosis of the skin	 1
Bacterial infection	 15
Allergy (contact)	 7

Conclusion

Points of interest in this study are:-

1. Preponderance of Trichophyton purpureum (Epidermophyton rubrum) over Epidermophyton floccosum.

2. A fairly large number of cases of monilia infection causing perionychia. The significance of the presence of monilia in cases of perionychia deserves further study as to the species of monilia prevalent and the rôle of this fungus in the causation of this disease.

777		
	ADI	.15
ъ.	$^{\rm ADL}$	40

	1	2	3	4	5	6	7
	Total number	Fungus positive in micro- scopic examination	Fungus negative in micro- scopic examination	Culture positive from column 2	Culture positive from column 3	Total cultures positive from columns 2 and 3	Fungus positive but fungus could not be isolated
Infection of the nails	209	181	28	162	9	171	19
Species identified— Trichophyton purpureum Epidermophyton floccosus Trichophyton violaceum Trichophyton gypseum	(Epidermoph	yton rubrum) 94 60 1 7	6 3 0 0		00 63 1 7	

Of the 19 absolute negative cases, 13 were psoriasis, 1 case of dystrophy of the nails and 5 cases remained undiagnosed. These cases were changes in the nail plate due to systemic conditions.

Group II: Lesions of the tissues surrounding nail (perionychia).—In this group 47 cases were studied and cultural study was more helpful than the direct microscopic examinations.

Clinically the condition was that of swelling and ulceration of the tissues surrounding the nails. These lesions had the characteristic 'bolster-like' swelling and thick creamy or milk-white discharges. There was ulceration in the nail fold spreading underneath the nail root. Pain, tenderness and a peculiar violet discoloration of the tissues were present in almost all cases.

Total number of cases studied-47.

Number of positive findings of fungus infec-

Number of negative findings of fungus infection—25.

FRACTURES OF THE PATELLA*

By A. K. BASU, M.S. (Cal.), F.R.C.S. (Eng.)
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Calcutta

That the treatment of the fractures of the patella is not yet standardized is quite evident from the number of different methods advocated and the controversy raging round this problem. Brooke (1937) of the 'Excision of Patella' fame recently followed up 54 of his cases treated 5 to 15 years previously. His faith in the efficiency of this operation was reiterated and reinforced as the result of this follow-up. An immediate controversy followed the appearance of this paper in which Max Page (1946), Bankart (1946), Tippett (1946) and others participated and expressed their profound disagreement from the views of Brooke. I have in this short paper dealt with only one

^{*}Read at a meeting of the Scientific Section of the Annual Medical College Reunion, 1948.

particular type of operation which I believe should be more generally performed and the results of which I trust would be better than the orthodox operation of suture or wiring. number of such operations has been small and the judgment on its true worth must await the evaluation of its long-term results at a later day. At the moment, it is a preliminary communication based on the anatomical and functional factors affecting this none too uncommon type of

Whether the patella is a sesamoid bone developed in the tendon of the quadriceps aponeurosis is a controversial question. There are cogent arguments for and against this popular belief, which is not profitable to discuss here. Suffice it to say that the tendon of the quadriceps aponeurosis gets only a very small and insignificant attachment to the sloping surface of the patella and is mainly continued downward—to be continuous with the patellar ligament—which is really its tendon of insertion. Union of the two fragments of bone in a case of fracture of the patella is threfore not essential for the proper function of the knee joint. It is the continuity of the quadriceps aponeurosis which is essential. Again when one looks at the patella from its broad perspective one finds that the articular surface of the bone, which is the important surface so far as the function of the knee joint is concerned, comprises only the upper 2/3: the lower 1/3 is non-articular. A fracture, therefore, through the lower 1/3 of the bone, would leave this important articular surface unaffected and would, provided the continuity of the quadriceps aponeurosis be unaffected; be of little consequence. Even a fracture through the middle of the bone would leave the far greater part of this surface intact in the upper

Functions of the patella.-Gray's Anatomy mentions two functions of the patella: (i) to protect the front of the knee joint, and (ii) to increase the leverage of the quadriceps and augment its power by holding its tendon in front of the axis of movement of the joint. Brooke, of course, totally disregards them. He has categorically asserted that the patella is an unnecessary adjunct to the knee joint, that it is an integral part of the skeleton only because it is phylogenetically inherited and that function plays no part either in its formation or in its growth. It is a morphological remnant which is tending to undergo reduction and to disappear. About the leverage action of the patella, Brooke says that 'the patella has been adapted to play a part in the movements of the knee joint but was not designed for this purpose, and although theoretically its presence should enhance the power of quadriceps muscle in practice there is considerable doubt as to its mechanical value in assisting movement at the joint; rather there is evidence that it has become imperfectly adapted to the mechanism of the joint and thus has a deterrent action on a

machine for which it was never designed '. Not many would, in the absence of more categorical evidence than has hitherto been forthcoming, agree with this view about the utility of the patella. It would be more rational to think that unless the presence of the patella in any way hinders the full range of movement of the joint or any other way be deleterious to its function, it would be better surgery to preserve it or any considerable part of it that can be preserved.

Types of fracture of the patella.—Many different types of fractures of the patella are

known:

1. Comminuted stellate fracture due to direct violence without separation and generally without rupture of the lateral aponeurosis.

2. Transverse fracture without separation of fragments and without rupture of lateral expansions—a rare variety.

3. Transverse fracture with separation of fragments and invariably associated with lateral aponeurotic tear—the commonest type.

4. Fracture separation of a small fragment

of the patella.

5. Open fracture of the patella of the various

types.

Site of transverse fracture.-Looking at a series of cases of transverse fracture of the patella, it occurred to me sometime ago that this type of fracture in the majority of cases occurred at about the junction of the upper 2/3 with the lower 1/3 of the bone, i.e. at about the junction of the articular with the non-articular lower area of the bone. This has been confirmed by the last 6 consecutive cases of transverse fracture of the patella that I have had the opportunity to treat, in all of whom the fracture line has passed through this region. Further confirmation came from the investigation of a series of skiagrams in the x-ray department of this hospital in which approximately 60 per cent were of fractures of this type. An anatomical explanation of this lies in the fact that at the moment when this type of fracture occurs, i.e. in the attitude of semiflexion, the upper 2/3 of the bone is usually in contact with the front of the femoral condyles—the remaining 1/3 projecting forwards and downwards totally unsupported. The lower end is fixed by a few fibres of the patella tendon, while. a fulcrum is provided by the point of contact at the junction of the supported and unsupported part of the bone. The quadriceps aponeurosis acts as a strap and the contraction of the quadriceps muscle exerts a cross breakage strain with the result that the bone is snapped across at about the junction of the lower and middle 1/3. There is almost always an accompanying tear extending to either side and involving the expansion of the quadriceps aponeurosis.

Principles of treatment.—The principles of treatment in a case of fracture of the patella

are :-

1. Repair of the quadriceps aponeurosis especially of its lateral expansions when they are torn-because on the strength of this repair will

depend the future power of extension of the limb.

2. Providing for a smooth articular surface for smooth gliding over the articular surface of the femur.

3. Physiotherapy and rehabilitation especially toning up of the thigh muscles. It is surprising how much atrophy and loss of tone of these muscles occur in these cases even in a few days.

Working on these principles and bearing in mind the anatomical data discussed above, I have treated 6 cases of transverse fracture of the patella, by removing the lower fragment and repairing the quadriceps aponeurosis with silk sutures used as a darning material, much in the same way as Ogilvie does for his hernior-rhaphy operation. The details of the technique are as follows:—

Immediately after admission a moderately firm bandage is put on the knee joint over a big pad of cotton-wool and the limb immobilized on a light posterior splint extending from the middle of the thigh to the middle of the leg. It is desirable that this should be a light metallic splint and it should be of the trough variety. Elevation of the limb is essential so that the blood in the joint should be absorbed quickly and the patient should be coaxed and cajoled into performing regular and frequent quadriceps exercise.

Date of operation .-- On an average the operation has been performed about the 14th day after the injury. This might seem an unduly long delay but has been considered necessary owing to the desirability of getting the superficial abrasions which are often present healed and the surface skin cleaned as much as possible. In one case in which the fracture was associated with a penetrating skin wound, and in which there was intra-articular infection, it took 6 weeks for the joint condition to clear up completely. The point against this delay is the consolidation of the extravasated blood in and around the joint, formation of adhesions and also the atrophy of the quadriceps which results during this waiting period. Both these disquieting complications can to a certain extent be provided against by regular and persistent quadriceps exercise and massage but the operation should be performed as quickly as possible.

Incision.—In all these 6 cases the midline vertical incision was used. This incision has been very satisfactory and can confidently be recommended. In previous years the lateral J-shaped Kocher's incision was in general usage. This had several disadvantages:—

- 1. The incision had to be unnecessarily long.
- 2. Good deal of dissection was necessary to expose the fracture properly.
 - 3. Repair of the wound was difficult.
- 4. There were often areas of necrosis at the curved portion of the incision. The midline incision avoids all these disadvantages. Exposure is direct, adequate and healing without exception has been by first intention.

After the fracture is adequately exposed one finds a large amount of clotted or unclotted blood between the fragments. This should be gently removed by swabs or sponges. Often there are tags of aponeurosis lying between the two fragments. These should be removed. The lower fragment should next be dissected out and removed. Often it is in more than one piece and care should be taken to see that one or two small fragments of loose bone are not left behind. In one of the cases under report post-operative x-ray revealed one tiny spicule of bone which had been left behind. The dissection of the fragment should be very carefully done and no part of the aponeurosis must be removed to make the dissection easy.

Repair of the quadriceps.—In these 6 cases, silk thread was used to repair the quadriceps aponeurosis. There may be many different opinions about the best suture material for this purpose. The advantages of silk are that it is readily available in any quantity, can be boiled, is strong and, in the absence of extraneous infection, produces the minimum of reaction. Removal of the lower fragment helps repair in as much as it produces certain amount of relaxation of the stretched aponeurosis. Repair should be thorough, and in addition to suture of the torn edges, I used the silk as a darning material to reinforce the suture line.

Post-operative treatment.—The post-operative management is the most important part of the treatment and on its efficiency depends much of the success of the treatment. Until the skin sutures come out on the 8th day, the limb is kept on a light posterior splint but from the second day after operation the patients are encouraged to voluntarily exercise the limb to lift up against gravity at first probably with a little support and progressively by themselves. The quadriceps must be consciously and continually exercised.

The splint has been dispensed with on the 8th day and a firm bandage used in its place and the same exercises are carried on. Weight bearing with support has usually been advocated after the 14th day and flexion exercises also started from this day onwards. Exercises should as far as possible be of the active type and with co-operative type of patients it is remarkable how the range of movement has progressively increased. The patient usually walked about the 4th week.

Results.—Altogether 6 operations of this type have up till now been done and one can claim that the results have been satisfactory.

The first patient returned to active duty 3 months after the operation. He is a clerk at the Government Telegraph Check Office and he walks up and down about 50 steps every day. About his movements, flexion is normal and full, but there is slight weakness of extension compared to the normal side, which is expected to improve with time (figures 1 and 2, plate XI).

The next two cases were lost sight of since the 15th August, 1947, because they migrated to our

sister dominion. When discharged from the hospital and subsequently they were walking about. Movements of the joint were 3 of normal.

The 4th case is the one that may be called unsatisfactory. This was a heavily built man of about 55 who had a transverse fracture of about 6 months' duration. The fragments had united by fibrous tissue. The articular surfaces were irregular; he complained of lot of pain and was limping badly. This was the case in which a small tiny fragment had been left behind after operation. Four weeks after operation flexion was up to 30° and the patient complained of pain on flexion movement. Extension however was powerful. The patient was not of a very co-operative type and insisted on leaving hospital after about 6 weeks. A letter to his address has not elicited a reply yet.

The 5th case was a lady who had suppurative arthritis of knee following the fracture. She fortunately responded very well with intraarticular penicillin and alkaline washes. She was operated on 5 weeks ago (figures 3 and 4, plate XI).

The 6th case has been recently operated on.

The advantages of the operation may be summarized in a few words:

- 1. When the operation is efficiently performed, one can be quite sure of a smooth articular surface of the patella articulating with the front of the femur. In the orthodox operation of suture or wiring—even if done with meticulous care—the articular surface is often uneven and 'steps' are frequently seen. This is confirmed by such an eminent orthopædic surgeon, as Bankart (1946), who says: 'Suture or wiring however carefully done is a mechanically inefficient method of uniting transverse fractures. Frequently the result looks perfect on the operating table but the x-ray photograph taken a few days later show tilting of the fragments and separation of the fracture surfaces'. For this reason, Bankart (loc. cit.) advises pegging the fragments with a bone peg in addition to wiring.
 - 2. By the removal of the lower fragment the aponeurosis becomes lax and its firm suture and apposition become easier.
 - 3. During the post-operative period it is not necessary to wait for bony union between the fragments. Fifteen days should be enough for union of the two halves of the aponeurosis and then the patient can be encouraged to start weight bearing and begin flexion exercises with safety. Nor is rigid plaster immobilization necessary in the initial period and with adequate quadriceps exercise most patients should be able to return to work within the 3rd month. In the operation of suture or wiring if one desires bony union, convalescence is a prolonged affair and most patients have to wait for 6 months or longer before they can return to work and even flexion is only about ½ of normal.

4. This operation preserves the mass of patella and thereby its leverage and protective function.

Conclusion.—It is not claimed that the operation is suitable in all types of fractured patella. Undoubtedly there is place for total excision in comminuted fracture especially in the older types of patients. Suture or wiring may also be recommended in a very limited number of cases where the line of fracture is high up. When however the fracture line is near the superior border, the upper small fragment can be excised with impunity and there will be all the advantages of the excision operation without the disadvantages of suture.

In the majority of cases of transverse fracture of the patella, the fracture line passes through or about the junction of articular and non-articular area of the bone and the operation of partial excision with firm repair of the aponeurosis when followed up by adequate post-operative exercises should produce results better than

those hitherto obtained.

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. HEREDITARY CHONDRODYSPLASIA

WITH A CASE REPORT

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This condition, known variously as Multiple Cartilaginous Exostosis, Diaphysial Achalasia or Multiple Osteochondroma, is a developmental disturbance of the skeleton characterized by retardation of longitudinal growth, expansion of metaphysis and the presence of cartilage-capped exostosis on the end of shafts of long bones. It is a hereditary condition and becomes manifest early in childhood, progressing gradually during the growth period, and becoming stationary when the adult life is reached. The short and flat bones may also show exostoses but the epiphyses and bones performed in membrane are never involved.

The clinical picture presented by the patients suffering from this condition is characterized by distortion of bones with consequent deformities in the extremities associated with multiple

exostoses in youthful subjects of stunted growth. The early onset of the diseased process and the hereditary tendency are the other prominent features. The latter is a universal feature, usually all brothers and sisters of the affected parents being afflicted more or less, though one or two in the same family may occasionally escape.

The skeletal manifestations take three forms

as follows :-

1. Retarded longitudinal growth of long bones.—This retarded growth is distributed unequally, the ulna and fibula being usually shorter than the radius and tibia. The latter bones, growing uninterruptedly, become bent and produce ulnar deviation of the hand and lateral displacement and angulation of the talus.

2. Expansion of ends of shafts of long bones.—These become most marked at the ends from which largest growth of the bones in the lengthwise direction takes place. The upper end of the humerus, lower end of the radius and lower end of the femur are the portions most affected in this way. These are also the points

from which exostoses take origin.

3. Exostoses.—They consist of bony skeletal outgrowths of varying sizes with thin cartilaginous caps. They usually contain a base or pedicle of normal bone capped by a thin layer of cartilage, and when sufficiently old, show layers of cortical and cancellous bone well differentiated in a skiagram. The cartilaginous cap may show irregular areas of calcification in older subjects. The outgrowths springing from the metaphyseal ends of long bones grow as spurs parallel to the shaft.

The symptomatology presents no unusual features as the exostoses soldom cause pain or discomfort unless an intervening bursa gets inflamed. The progressive deformity and the stunted growth are generally noticed quite early. The intelligence and mental faculties remain unaffected. There have been reports in the literature of some of the exostoses turning malignant in later life but the incidence is so rare as to justify no more than casual mention.

Pathogenesis

In trying to explain the cause of this condition, Geschickter stresses on the embryonic processes concerned in the formation of bones. He emphasizes that all components of bone, whether fibrous, cartilaginous or osseous, are derived from a preceding connective tissue—the primitive connective tissue—which has the power of forming both cartilage and bone. The series of developmental steps which ultimately result in the adult skeleton follow a fairly long sequence which persists until late in life. Islets of this primitive embryonic tissue may be left in the metaphyscal zones with their primitive The islets may thus characters unchanged. cause overgrowth of cartilage cells which organize into exostoses. Geschickter further considers that the growths are due to a congenital

defect in the perichondrium arising at a point in the bone predestined for the insertion of tendons. Nature provides a gap in the membrane in such points through which the bulge in the bone protrudes to meet the adjoining tendon and exostoses occur if the periosteal gap and the bony protuberance do not exactly approximate each other. The widening of the metaphyses and the inhibition of growth in the bones are ascribed to disturbances and deficiencies of the periosteum in such points.

English authors accord to the conception of Keith the pride of place in explaining the symptoms. Keith's conception follows the discovery of John Hunter that the growth of bones consists of two distinct processes: (1) New bone is deposited in the metaphyseal junction at the

ends of the shafts—the so-called cartilaginous growth disc. (2) A process of modelling, by which the new bone thus laid down is shaped, pruned and reformed so as to form an interest of the cartilaginous growth disc.

'intrinsic architectural part of the cylindrical shaft'. Keith considers that in the disease under review the modelling process is retarded or even stopped though the deposition of new

bone continues as usual. Normally, the periosteum is attached to the edge of the epiphyseal plate distal to the metaphysis and growth proceeds the periosteal cuff covering the

cartilaginous growth disc also extends pari passu, so that the disc is always covered with periosteum or perichondrium. The osteoblasts

and osteoclasts, derived from this periosteal cuff, model the growing cylinder of bone in such a way that the normal shape is maintained. If, for some reason, this periosteal extension is arrested,

small areas of newly formed bone remain uncovered and free from the activities of osteoblasts and osteoclasts. These uncovered areas are then free to expand in abnormal

directions with consequent growth of the irregular protuberances known as exostoses.

The endocrine glands have been brought in by Keith to explain the shortening of the affected bones and the expansion of the metaphyseal ends. The primary cause for these abnormalities are stated to be due to an irregular grouping and division of the eartilage cells and Keith considers that the dysfunction of the thyroid gland is responsible for this behaviour. Hume, on the other hand, makes the pituitary and the gonads responsible. Jansen considers that the sympathetic nervous system is at fault. None of these hypotheses seem to have any scientific basis, however, and the causal factor still remains in the dark.

Case report

The pathological features and hereditary tendency of this disease are well illustrated in the following case who came to us not so much for the deformities but for the attacks of pain which he was getting lately and which was interfering with his work.

Hindu male, aged 24, by occupation a clerk, complains of pain in the right hip, especially marked from first rising from bed and getting easier after movements, but not disappearing completely. These pains first began to appear in the small of his back sometime ago, travelling down both the lower extremities. There were tingling and numbness also.

The patient is stunted in his growth. Mental faculties are clear and he is quite normal intellectually. Both the upper extremities are deformed, shortened and curved medially, the arms and forearms being both similarly affected. Both knees are strikingly deformed and the lower extremities are shortened. The chest is narrow and the ribs are sunken in, the result of rickety deformities in early childhood (figures 1, 2, 3 and 4, plate XII).

Family history.—Of the five brothers, including himself (two living at present) and three sisters, all of the former had these deformities which are less marked in the second and the fourth. The youngest sister has well-marked deformity, the others being absolutely free. The full family tree is delineated in the accompanying chart with the affected and unaffected members differentiated clearly.

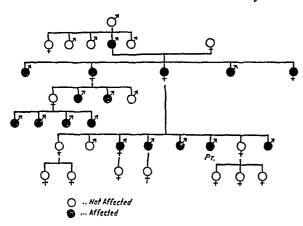


Fig. 13.

The father of the patient had an old gonococcal infection and his W. R. was positive.

Personal history.—Patient is said to have had rickets when he was two years old. He first noticed the commencing deformities in his upper extremities when he was six years old. The knees and lower extremities were markedly affected two or three years later. The pains started only a few months ago and are still continuing. W. R. 10/10* but there is no history of personal exposure.

No other abnormal physical findings are present:

Radiological examination.—Skiagrams of the patient's bones and those of his brother and

sister are presented herewith which show many of the features described above. The radii in both forearms are fully formed but are curved medially (figures 5 and 6, plate XII). The ulna is stunted longitudinally with a tapering end falling far short of the wrist joint. The cortex is thin at the distal extremity of the latter. The cancellus structure is wide, translucent and irregular. The lower articular surface of the ulna is absent. The wrist shows subluxation. Budding exostoses are found in the interosseous space facing each other from the contiguous metaphyseal regions. Their tips are still lined with cartilage. The elbow joint is deformed as the articular surfaces of bones forming it have developed a distorted axis.

The knee presents widening and elongation of the metaphyseal regions of the femur, tibia and fibula (figure 7, plate XII). The cortical bone is thin, the cancellus architecture is irregular and multiple exostoses are present in the neighbourhood.

The hip shows the upper end of the femur (figure 9, plate XII) shorter than normal, the neck is wide and there is marked coxa valga. The cancellus architecture is particularly abnormal here. The superior ramus is wider than normal and the cancellus structure is irregular.

The chest (figure 8, plate XII) is narrow, the ribs sloping sharply downwards and the intercostal spaces are narrowed. These are perhaps manifestations of his rickety condition in his early life.

Figures 10 and 11, plate XII, show skiagrams of the right forearms and right knee of the elder brother. These show exactly similar features as those of the patient himself.

Figure 12, plate XII, shows the skiagrams of the patient's sister aged 8 years. The left elbow, as represented in the x-ray picture, shows exostosis at the lower end of the humerus. The shaft is narrow. There is deformity of the joint due to abnormal axis of the articular surfaces.

Summary

A case of hereditary chondrodysplasia is presented with a complete family tree, list of affected persons in the family up to five generations, photographs of the patient and skiagrams of himself and some of his relations. The clinical manifestations and the pathogenesis are discussed.

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THE THE

THE THERAPEUTIC USES OF SEA WATER

PART I: THE EFFECT OF INJECTIONS OF SEA WATER IN SCAPIES *

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THE rich mineral wealth and the enormous amount of energy present in the sea is lying still unexplored. If these resources are properly explored it is certain we will have a number of valuable products available for therapeutic and scientific advancement.

It was pointed out by us (Chowhan, 1941) that epileptic attacks and mental disturbances in man may be due to imbalance of mineral constituents of blood leading to disturbances in the water balance of the body. The knowledge that the mineral contents of sea water are more or less similar to that of body juices lead to the consideration that injections of sea water would be beneficial in the treatment of some of the venturing mental conditions. Before parenteral therapy of sea water in human being, steps were taken to find out whether an injection of sterile sea water into the animal organisms would cause any systemic distur-Venkatachalam et al. (1943) intravenous injections of sea water in a few dogs which were used as experimental animals. In another batch of animals intraperitoneal injections were given. Such injections produced no untoward effects in these animals. In the case of one animal which happened to be suffering from Canine mange, it was noted that the animals got completely rid of this disease. The raw patches healed up and their hair began to grow rapidly on the denuded areas. Further trials were made on 20 animals suffering from Sarcoptes scabie and 30 animals suffering from follicular type of mange and one bull suffering from ringworm. All of these animals were cured of their lesions. These animals were given intravenous or intraperitoneal injections of filtered and sterilized sea water in doses of $\frac{1}{2}$ c.c. per kilo body weight. A maximum dose up to

20 c.c. was tried on alternate days without any untoward effects.

Dhairyam (1944) reported that sea water with its iodine and saline contents stimulates the thyroids and the suprarenal gland cortex. In his cases, in the Mental Hospital, Madras, obtained gratifying results with parenteral administration of sea water in certain types of mental disorders, insomnia, generalized weakness, obesity and ascites, etc. The common belief and practice in certain seaside areas that sea baths are useful for skin conditions as scabies, led the above worker to try sea water therapy in three cases suffering from scabies. He reported very encouraging results. suggested us to give trial of sea water therapy in army recruits.

During the years 1944 and 1945 there was a marked increase of incidence of scabies in South India and consequently there was a great loss of man-power to the army as persons suffering from scabies were rejected as unfit for recruitment. In order to conserve man-power it was later decided to enroll persons suffering from uncomplicated scabies into the army and to treat them in the military hospitals before despatching them to units for active military duties. This gave an opportunity to the senior author to pick out batches of recruits suffering from typical lesion of scabies and try sea water therapy on them. This investigation was taken in hand particularly in view of the fact that drugs, like sulphur and benzyl-benzoate used in . the treatment of scabies as specific drugs, were practically not available in the market or were too costly for the extensive treatment of scabies in the civil, during the period of war. A search for such substitutes for the wartime costly drugs in scabies, it was considered, would be a valuable addition to the medical practitioners' armamentarium.

Recruit. scabies were selected r. . Centres at Bangalore, from the \mathbb{R} Technical Training Centres at Guntur, Bezwada and Madras and also from the Out-patients Department of the Golden Rock Hospital, South India, H. Q. Railway, at Trichinopoly. A trial was thus made on 280 patients.

Method of treatment

Sea water was collected at Madras harbour, about 2 miles away from the coast. It was filtered and kept in sealed bottles labelled as Itch Cure. Before injections the sea water was refiltered through double filter paper and sterilized by autoclaving or boiling for 5 minutes. Two or 3 c.c. of the sterile sea water were injected subcutaneously daily. A course of ten such injections was given and the clinical improve-

The patients under trial were isolated from others. A brief note of the clinical picture was recorded before the initial dose and after the No other 4th, 6th and 10th injections. treatment was given during the course of sea

^{*}A preliminary note read before the Military Medical Club, Bangalore, September 1945, and Indian Science Congress, Bangalore, Session January 1946, and in an abstracted form at the Indian Science Congress, Patna, January 1948. This work was done in a military hospital.

water therapy. The injection of sea water produced no local or general reaction except transitory pain at the site of injection. The fluid was rapidly absorbed. From table I it will be seen that after the fourth injection the irritation of the skin and severe itching subsided. The discharge from the impetiginous rash was slightly reduced. With further doses

treatment was started) there was practically not much relief. After the 5th and the 6th injections 51.4 per cent showed a clinical improvement and 29.7 per cent a marked improvement and after the 7th to the 10th dose 31.5 per cent showed a clinical improvement and 55.0 per cent cases showed marked improvement. Of the total 280 cases so treated with

. TABLE T Details of progress of a few cases of scabies treated with injections of sea water

No.	Name	Religion	Age	Total number of injection	Condition before treatment	Condition after treatment
B5-1578	T. N.	H,	50	11 ++	Severe itching, ulcerative and suppurative lesions, extensive, all over the body.	After 4th dose lesion drying up. After 10th dose the ulcers scabbing and withering up. Itching relieved 80 per cent.
B5-2788	K.	II.	20	10+++	Extensive lesion on penis, but- tocks and other parts of body.	(a) After 5th injections, all
B5-2104	R.	H.	26	1 +	Previously treated with sulphur but condition relapsed and lesions flared up again. Lesions over hands and deep ulcers on buttocks.	Lesion on hands improved, Admitted into the hospital for treatment of deep ulcers.
B6-4702	Α,	H.	22	9 +	Previously treated in a hospital with sulphur. Relapsed lesionin groin, buttocks and scrotum.	All lesions dried and scabbing cure 90 per cent.
A2-1279	G.	H.	20	8 +	Scattered on hands, legs and penis and scabbing.	Scabs drying up, relieved 60 per
B8-1575	P.	H.	55	9++4	Chronic, lesions, severe itching and ulcers all over the body.	All ulcers dry, Itching much
R-4254	A.	Ch.	54	8 +	Acute pustular type—hands, elbows and buttocks.	Dried up, scabbing and itching
A-5296	M.	H.	20	9 ++	- Acute pustular and generalized, itching severe.	
A2-4354	R.	H.	20	7 +4	Scabs, pustular eruption on but- tocks and webs of left hand fingers.	Scabs drying, cure 50 per cent.
B2-2199	A.	H.	22	7 ++	Pustular, generalized all over lower limbs, buttocks, hands and penis.	Much improvement. Lesioned drying up. Cure 80 per cent.
A3-3857	K.	K.	45	6 +	Diffused, papular lesions on waist, abdomen and chest.	Lesions improved. Itching stil persisting.

++= Warped lesion.

+++= Extensive lesion.

the pustules appeared to be drying up and were covered with healthy scabs. After the tenth dose the whole of the lesion appeared to be simply dehydrated and the scabs started peeling off leaving behind healthy skin. The itching disappeared in about 70 per cent of cases. The observations on 280 cases treated with sea water are shown in table II.

The cases treated were grouped according to the number of injections given and the results recorded as: (a) number of cases treated, (b) cases showing no improvement, (c) cases showing clinical improvement, i.e. relief in itching and reduction of the number of pustules and the rash, (d) cases showing marked improvement, i.e. the cases which were considered practically cured, the lesion having dried up and the scabs peeling off and the patient having practically no itching. It will be noted that with the first 4 doses (i.e. fourth day after the

TABLE II

Result of percentages of cure after different doses of sea water injected subcutaneously, 2 c.c. daily in 280 cases

Doses	Number treated	No improve- ment	Improved	Marked improve- ment
1-4 5-6 7-10	94 37 149	S6 (91.5%) 7 (18.8%) 11 (7.4%)	5 (5.3%) 19 (51.4%) 56 (37.5%)	3 (3.1%) 11 (29.7%) 82 (55.0%)
~ <u></u>	280	104 (37.1%)	80 (28.5%)	96 (34.2%)

different doses of sea water 37.1 per cent reported no relief; 62.8 per cent reported very encouraging results (i.e. in 28.5 per cent and 34.2 per cent clinical and marked improvement respectively).

The results with larger doses or after prolonged sea water treatment therapy is still under investigation.

Rationale of the sea water therapy in skin conditions and the other skin diseases. Quinton (1898-99) enunciated the view that in a great majority of animal organisms the internal mediums, the circulatory fluid or hæmolymph, from its inorganic compositions is but a representative of sea water. It is practically certain that the life on this planet began in the ocean and that the present terrestrial forms of lives are descendants of forms that once lived in the sea. The concentration of cations. hydrogen-ions and the diurnal variations of the body fluids of the sea animals is allied to that of the sea water. As the living organisms gradually ascended higher and higher in the zoological ladder and their bodies became free from and independent of the direct contact of the sea water, the salt contents of the body fluids were modified to meet the requirements of the specialized cells which those fluids bathe. Macallum (1903) advanced the view that the blood plasma of vertebrates and invertebrates with a closed circulatory system is in its inorganic salts but a reproduction of sea water of the remote zoological period in which the prototype representatives of such forms first made their appearance. The inorganic composition of the blood sera of mammals and that of ocean of to-day bear a striking resemblance. This resemblance is not in concentration for the salinity of the ocean, is almost three times that of mammal blood serum, but is in the relative proportion of the Na, K and Ca as indicated in tables III and IV. There is, however, a considerable variation in the Mag. in ratios. The relative concentration of Na, K and Ca and Mag. in the sea water and the body juices of various types of animals is shown in tables III and IV: here the Na-ion was taken as 100.

Table III

The proportions of metallic ions in the sea water and other physiological fluids taking sodium as 100

	Na	Ca	K	Mag.
Ringer's solution Sea water Fluid juice (Aurelia) Fluid juice (Cyanea) Serum of the dog Serum of other mammals.	100 100 100 100 100 100	3.34 7.71 3.84 4.13 3.86 2.52 2.58	5.86 3.66 5.18 7.67 6.86 6.69	11.99 11.43 11.31 0.81 0.80

After Macallum, A. B. (1903): The Journal of Physiology, Vol. 29, p. 213.

The alteration or disturbance of general organic and inorganic constituents of the body

TABLE IV

The proportion of sodium, potassium, calcium and the magnesium content of sea water and of various body fluids. The figures are based on chlorine content being taken as 100

	Chlorine	Na	K	Ca	Mag.
Sea water Lobster (Homa-rus).	100 100	86 96	1.9 3.9	2.1 3.4	9.3 0.85
Man	100	130	5.2	2.6	0.9

Heilbrunn, 1937: The Outline of General Physiology, 1937, pp. 35 to 57. W. B. Saunders and Co., Ltd.

fluids is known to manifest certain clinical symptoms. The conditions as bronzing in Diabets bronze (hamochromatosis); pruritus ani et vaginii with intertrigo; boils and carbuncles in diabetes mellitus; pellagra, cheilosis, phrynoderma and scurvy, etc., in the deficiency of vitamin A, B complex and C, etc., are some of the well-known examples. Deficiency of sodium chloride retards the growth of the skeleton. Hens are reported to produce less vigorous chicks and the pregnant rabbits abort in a mineral hunger. In man there is an imperfect growth and deficient nutrition as a result of salt deficiency. Salt-poor diet in cattle causes symptoms of human rickets, osteomalacia, in dogs and pigs weakness, trembling and paralysis occur on low salt diet (Mhaskar, 1948). The general condition and the health of the host also plays an important part in determining the susceptibility of the individual towards artificial infection and towards spontaneous recovery. Monnig (1938) maintains that Demodex, a very prevalent parasite, occurs practically on the bodies of all dogs. It produces Mange only when the general health of the animal has been affected by diseases which lower its natural resistance as distemper and by weakening the skin resistance as strong irritants or too frequent soap washes.

From the above observations it may be safe to conjecture that the introduction into the body of salts, in natural proportions as found in the sea water, may play an important rôle in the adjustment of the different salts of the body to their normal physiological level. The clinical trials have shown that parenteral introduction of sea water produces a definite improvement in skin condition as in the case of scabies and the mental conditions. Whether such improvements are due to the alteration of salt contents of the body juice or is due to the stimulation of the complex body defence mechanisms is still open for further investigation.

Advantages of sea water therapy over drugs in the treatment of scabies and other skin conditions

Sea water treatment is safe, cheap, and the resources are inexhaustible. This type of treatment may very well substitute the wartime

expensive drugs like sulphur, and benzylbenzoate. The treatment is very clean and has the advantage over the prolonged and messy use of sulphur ointment. In addition the patient experiences a feeling of general well-being after a course of sea water treatment.

Summary

- 1. It has been suggested that a number of clinical symptoms can be noted in eases where there is an alteration of mineral contents of blood.
- 2. The body juices and the blood serum in its organic constituents and composition are but a representative of sea water since the present terrestrial and avian forms of life are descendants of forms that once lived in the sea.
- 3. Subcutaneous injections of sterile sea water, in doses of 2 to 3 c.c. daily, have been advocated in various skin conditions particularly in scabies.
- 4. Sea water therapy was tried in 280 cases suffering from scabies. Of the total cases treated 60 per cent showed a distinct relief in their symptoms and were considered practically cured after a course of ten injections of sterilized sea water in doses of 2 to 3 c.c. daily.

The senior author desires to record his gratefulness to Colonel F. C. Wall, Technical Recruiting Officer, Bangalore; Brigadier Bull. Director. Recruiting, G. H. Q., A.G. Branch, Mecrut, for the interest they took in this work; Major V. T. Naidu, C.M.O., S. I. Railway Hospital Headquarters, Golden Rock, Trichinopoly, and various Assistant Technical Recruiting Medical Officers who carried out this investigation for him in their recruiting and training centres.

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TREATMENT OF MALARIA *

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In considering the treatment of malaria it is necessary to take into account two things, namely, the different stages of the development of malaria parasites and, secondly, the action of different drugs on different stages in the eyele. There are three stages in the human cycle with corresponding three forms of parasites in man. They are:—

A. Sporozoites -> B. Tissue forms -> C. Blood forms:

Mosquitoes

(i) asexual forms causing fever,
(ii) sexual forms infecting mosquitoes.

A. Sporozoites are forms of parasites that, as you all know, are injected by the mosquito into man. They occur in the blood for a short while only, about half an hour. No symptoms are produced by them and no drug is known to affect them. They do not invade the red cells

as previously believed.

- Tissue forms represent the intermediate stage into which the sporozoites develop and from which the asexual blood forms which produce fever arise. The sporozoites after being introduced into human body by mosquito first grow and multiply in the endothelial tissues. Such tissue forms have been demonstrated by some German workers, and James and Tate in bird malaria. Very recently Shortt and Garnham have demonstrated them in monkey malaria, and we hope in the near future they will also be seen in human malaria.† And it is rational to accept their existence as no parasites are seen in the blood for a week or so after injection of sporozoites by the mosquito; even transfusion of blood is unsuccessful during this stage. They are called pre- or exo-erythrocytic (e.e.) forms, i.e. the forms outside the erythrocytes. Here a sort of storehouse is formed from which new forms of the parasites are released into the blood, which eventually cause fever. The latter are readily acted on by most antimalarial drugs and the fever is controlled, but the tissue or e.e. forms tend to persist especially in B.T. cases and may periodically give rise to blood forms causing relapses.
 - C. The blood forms include:-

(i) asexual parasites (rings, schizonts, rosettes and merozoites) causing fever. After several generations of schizogony they also give rise to

(ii) gametocytes which cause no fever but infect anopheline mosquitoes biting an individual.

Next we come to the actual treatment of an attack of malaria. For chronological reference we may mention three eras of drug therapy—the

also in man by Shortt and his colleagues.

^{*}Being a lecture delivered to the medical officers of mines, Asansol, in January 1948. †Exo-erythrocytic forms have now been demonstrated

quinine era, the atebrine era and the present era

of new drugs.

Quinine therapy.—Given by mouth quinine is rapidly absorbed. It has no action on the sporozoites, it has no action on the e.e. forms and acts best on the asexual forms in the blood. Its action is slight on the gametocytes of B.T. quartan malaria while crescents unaffected. For effective action a blood concentration of about 5 mg. per litre is desirable. Ten grains of quinine sulphate are given twice a day for an average case; thrice a day for first three days in heavier M.T. infection. It is unnecessary to recommend one of the more soluble and expensive salts such as bisulphate or bihydrochloride, since all salts of quinine are reduced to the base before absorption in the For weak men and women the dose may be reduced to $7\frac{1}{2}$ grains. The dose of children in grains is calculated as $1\frac{1}{2}$ plus half the age in years and is best given in honey or treacle. In most cases the asexual parasites disappear from the blood and the fever subsides in three days, but the treatment should be given for 7 to 10 days altogether. Quinine should be given in solution; tablets are uncertain as they may not be dissolved in the alimentary tract. If for any reason they must be given, the more soluble salts are preferable and are best given, broken up after food. Tablets are better started after the fever is controlled with the mixture.

Although of little importance mild side effects are common and consist of ringing in the ears and headache which along with the bitter taste of the mixture are often disliked by patients. Occasionally idiosyncrasy to the drug is also encountered, viz, urticaria and hæmoglobinuria. Quinine has been known to precipitate an attack of blackwater fever and should not be used in

this condition.

Atebrine or mepacrine therapy.—Mepacrine is less slowly absorbed than quinine and is excreted very slowly, hence it accumulates in the body. Like quinine it has no action on forms and crescents. sporozoites, e.e. acts directly on the asexual parasites. The immediate effect of mepacrine in an acute attack is similar to that of quinine, the fever being controlled in an average period of three days or so. Regarding its dosage, until recently the standard dose was 0.3 gm. (i.e. 3 tablets) daily for 5 days. Recent pharmacological studies have shown that initial loading doses are necessary to raise the effective plasma concentration quickly, i.e. 30 microgrammes per litre. In the army as much as 28 tablets were given in 7 days of which 8 were given on the first day, but this is not suitable for our civilians for whom a four-day treatment has been recommended, viz, 6 tablets, i.e. 2 tablets t.d.s. on the first day, 4 tablets, i.e. 2 b.d. on the second day, 2 tablets, i.e. 1 b.d. on the third day and one tablet on the fourth day-13 tablets altogether in 4 days. This is effective, more economical and perhaps less toxic than the old

standard treatment. For children ½ to ½ the adult dose is given according to age:—

Day	1	st	2nd	3rd	4th	ì
1. Adult dose		6 4 2	4 2 1	2 1 1	1	tablets

It is desirable to give mepacrine after food

and supply plenty of fluids to drink.

Much has been said about its toxic effects, but there has been a good deal of misunderstanding on the subject. It is usually non-toxic in therapeutic doses although occasional intolerance is encountered. In comparison with quinine it is easier to take and safer in pregnancy and blackwater fever and the course is shorter. Yellow staining of the body and occasional nervous and gastro-intestinal symptoms or lichenlike rash are its disadvantages.

In the present era several new drugs have been in prominence, viz, paludrine, chloroquine and CAM-AQI, and in future more are expected.

Paludrine.—Paludrine is a biguanide compound which is entirely different from quinine or mepacrine. It has a bitter taste and is slowly soluble. It has no action on sporozoites, but there is evidence to show that it has lethal action on e.e. forms of M.T. malaria and inhibitory action on those of B.T. malaria. Consequently a dose of 0.1 gm. once every two or three days acts practically as a true causal prophylactic against M.T. infection but not B.T., so that clinical attacks may occur where the suppressive treatment is discontinued, but through its schizonticidal action fever is usually suppressed while it is being taken. After oral administration it is rapidly absorbed and is excreted fairly rapidly (in 3 to 7 days). It acts directly on the asexual parasites especially in their schizont or preschizont stage, inhibiting nuclear division and producing degenerative changes in the parasites. does not prevent the appearance of gametocytes; crescents often persist for a long time—in one case of our series they were found daily for 55 days. It has however some devitalizing effect on the crescents; they do not grow in the mosquito beyond the occyst stage if it bites the patient within a week of paludrine They however regain their administration. infectivity once the drug is eliminated from the

The usual daily dose is 0.3 gm., i.e. 3 tablets of 0.1 gm. each (tablets of 0.3 gm. are expected in the near future). Given daily it will effect a clinical cure in an average Indian patient within 3 days, comparable to quinine and mepacrine, in about 90 per cent cases (figure 1). One day extra, i.e. 4 days, or as long as the fever persists, is a satisfactory course. In severe cases the dose is increased, e.g. 2 or 3 tablets twice or thrice daily with sufficient water. Any dose, if vomited, should be repeated. The original standard course of one tablet thrice daily for 10 days was said to eradicate M.T. infection, but this is not always true with all

Indian strains some of which may prove refractory to paludrine. Here is the temperature chart of a patient with M.T. infection

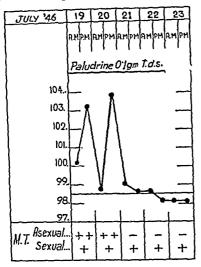


Fig. 1.—Falciparum malaria treated with paludrine, 0.1 gm. thrice daily for four days.

relapsing 9 days after treatment with 100 mg. thrice daily for 10 days. In this case the same course was repeated using a different sample of the drug, but he relapsed again after 11 days when he was given a different drug (chloroquine) which brought down the temperature quickly and he had no relapse for over three months of our observation (figure 2). Besides, a ten-day course though desirable in M.T. cases to minimize the chance of relapses is not always practicable among the masses the majority of whom do not care to continue the drug after the fever stops, nor does it always guarantee against relapses. Paludrine is however a potent

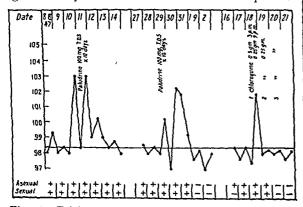


Fig. 2.—Falciparum malaria relapsing 9 days after treatment with 0.1 gm. of paludrine thrice daily for 10 days when the same course was repeated, but the patient relapsed again after 11 days when he was given — chloroquine (SN 7618).

drug, being more effective in M.T. than in B.T. malaria; even a single dose of only 300 mg. is capable of controlling the fever in about 3 days, but early relapses (in about 3 weeks) are only too common (figure 3) and occasionally recrudescence

or failure (figure 4) may occur. Early relapses are less common after four- or ten-day course. Considering all these points the four-day course is ordinarily recommended for clinical cure, being effective, economical and easily acceptable to the masses with whom you mostly deal. It is however very desirable that it should be followed

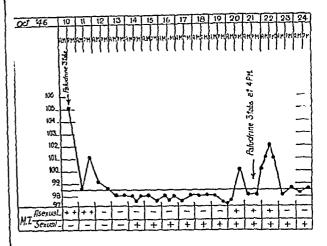


Fig. 3.—Falciparum malaria treated with single dose of 0.3 gm. paludrine, having early relapse.

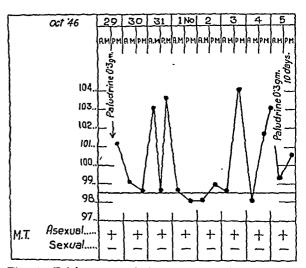


Fig. 4.—Falciparum malaria not responding to single dose of 0.3 gm. paludrine.

by one tablet at least twice a week, say every Sunday and Wednesday as long as possible, preferably 6 months with a view to preventing relapses and incidentally reinfection. The dose is proportionately reduced in children, but they tolerate it very well. Children may be given half the adult dose and infants quarter the dose. Those above 10 years should be treated as adults.

At the present time paludrine is readily available and cheap, being less complex chemically. It is non-toxic in therapeutic doses, the range of which is fairly wide; it can be safely used in blackwater fever and pregnancy. There is no fear of cinchonism, hæmoglobinuria, mepacrine psychosis or yellow staining of the body. In

A rubber catheter was passed into the bladder, the wall of the sac was partially excised and sutured in three layers with catgut. Wound closed in layers with a drain in situ.

Commentary .- An unusual case of divertitulum in the floor of the bulbous portion of the urethra is described. As regards its causation there are two possibilities: (a) That a small congenital diverticulum existed, leading sedimentation and consequent calculus formation and as more and more calculi formed the sacculation increased in dimensions. (b) That a small impacted stone in the urethra led to its dilatation in the direction of the least resistance and with the formation of fresh stones the dilatation continued in the floor of the urethra.

The dribbling of urine after the act of micturition even at the age of one year is more in favour of its being originally a congenital defect.

P.S.—As regards the result, the patient was still under treatment when the article was written. The wound healed up completely later on and there was no more

I am indebted to Lieut.-Colonel A. K. Dev, I.M.S./ 1.4.M.c., Officer in charge, Surgical Division, for permitting me to operate on and report this case.

AN UNUSUAL CASE OF LUMBAR HERNIA THROUGH PETIT'S TRIANGLE

By A. K. DUTTA GUPTA. M.B. (Cal.), r.n.c.s. (Eng.) Second Honorary Additional Surgeon, Medical College Hospital, Calcutta

Patient 'S', female, aged 28 years, unmarried, occupation tailoring, admitted into the Medical College Hospital on 28th October, 1947.

Complaints—(1) swelling in the right lumbar region, duration 6 years, and (2) pain in the

swelling, duration 2 years.

History of the illness—for 6 years she noticed a swelling appearing in the right lumbar region above the iliac bone. The swelling used to appear on straining or standing and disappear on lying down on the left side or by pressure. The swelling is gradually increasing in size. For the last two years, the patient has felt a dragging pain in the swelling. No history of fever during this period nor any other illness. She has been using a hernia belt for the last 2 years without any effect.

On examination:

General build and nutrition—fair. Liver and spleen—not palpable. Heart and lungs—nothing abnormal detected.

Local—a hemispherical swelling 6 inches in diameter situated in the back of the right lumbar region over the triangle of Petit extruding above to the last rib, below to the upper part of the gluteal region (2 inches below the iliac crest), medially to near the middle line, and laterally to the right anterior axillary line. It has a fairly well-defined outline except anteriorly (figure 1, plate XIII). It increases in size on coughing with expansile impulse and diminishes

when the patient lies on the left side, and is fully reduced on pressure. The swelling feels soft and boggy through which coils of intestine can be felt. Margins of the Petit's triangle are very well-felt and the gap admits 3 fingers deep into it. The swelling is tympanitic on percussion.

Patient has slight kypho-scoliosis with pigeon breast (rachitic) and multiple neuro-fibromatosis with pigmentation.

Treatment—operation of hernioplasty was

done.

Anæsthesia-nitrous oxide gas and oxygen.

A curved incision 5 inches long was made over the swelling parallel to and 2 inches above the iliac crest. Subcutaneous fat was incised in the same line. Posterior margin of external oblique muscle was seen. Latissimus dorsi muscle was markedly atrophied practically not visible. No muscle was seen in the floor of the triangle. Lateral margin of erector spinæ muscle was well-defined and formed the medial border of the gap. There was a fascial sac which was incised and true sac exposed. The sac was opened and cæcum. ascending colon, terminal ileum were found to be its contents. It was a sliding or gliding type of hernia, the sac forming the anterolateral part and the execum and ascending colon forming the posterior part. Appendix was removed. The sac anterolateral to colon was ligated by a pursestring suture of catgut and excised. The socalled fascial sac was also excised and shortened. The gap was repaired by fascial sutures taken from fascia lata of the right thigh, sutures placed between external oblique and erector spinæ muscle repair was reinforced in places by a few thick silk sutures. Skin was sutured by interrupted silkworm gut (figure 2, plate XIII). A narrow corrugated rubber sheet drain was left in the subcutaneous tissue through the posterior end of the incision, as the thick subcutaneous tissue showed a slightly oozing surface.

Drain was removed in 48 hours and sutures in 10 days with good union. There was some hæmatoma in the thigh wound (from where fascial sutures were taken) for which the stitches had to be removed earlier, collection let out and the wound allowed to heal by granulation. There was a rise of temperature for a few days during the post-operative period. It was controlled by penicillin and sulphadiazine.

The patient was discharged from the hospital

on 18th December, 1947.

C.mment

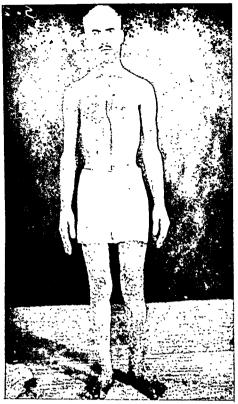
Lumbar hernia is divided into two groups :--

(1) Spontaneous, (2) traumatic.

Spontaneous lumbar hernia or the congenital form is a very rare variety of hernia and is less common of the two. It appears in two situations:

(a) Through the triangle of Petit bounded below by the crest of the ileum, anteriorly by the posterior border of external oblique muscle,

TREATMENT OF LICHEN PLANUS. A REPORT OF 12 CASES TREATED BY IMMUNIZATION THERAPY: S. C. DESAI. (O. A.) PAGE 212



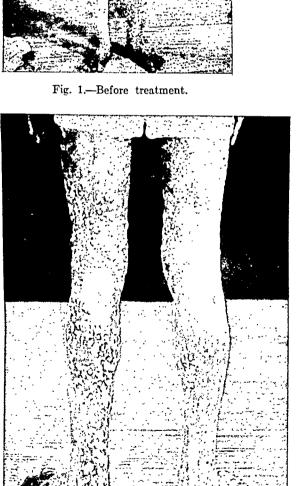


Fig. 3.—Before treatment.



Fig. 2.—Before treatment.



Fig. 4.—Before treatment.

ORT OF LICHEN PLANUS. A PORT OF 12 CASES TREATED BY UNIZATION THERAPY: S. C DESAI. (O. A.) PAGE 212

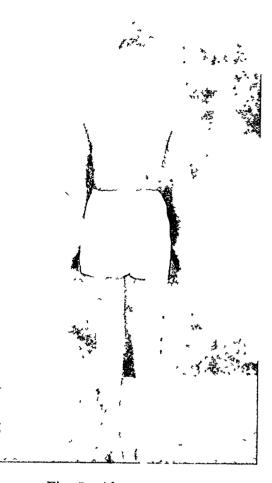


Fig. 5.—After treatment.

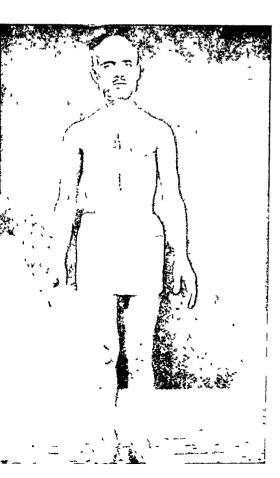


Fig 6.—After treatment.

PLATE XI

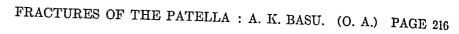




Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

LIVITI VIT

HEREDITARY CHONDRODYSPLASIA: WITH A CASE REPORT : AMAL DAS & R. BHATTACHARYA. (O. A.) PAGE 219

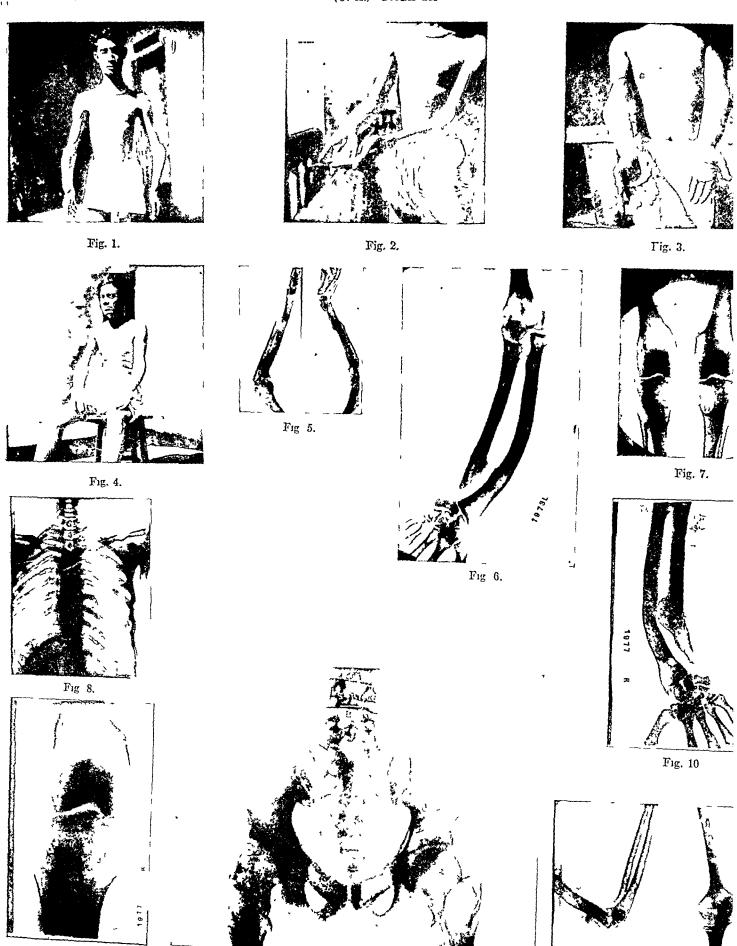
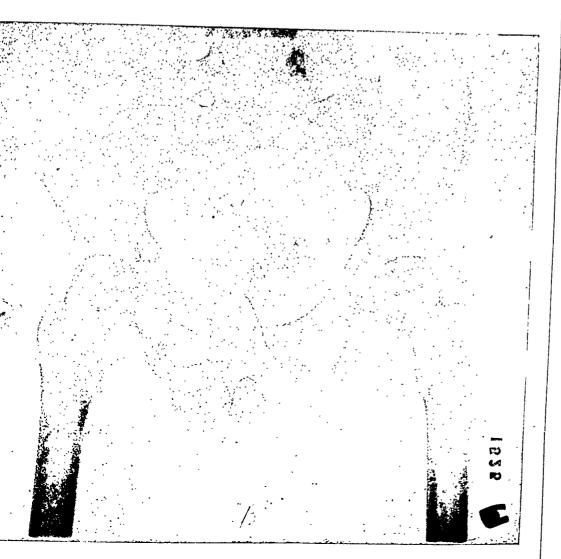


Fig 11.

AN UNUSUAL CASE OF LUMBAR HERNIA THROUGH PETIT'S TRIANGLE : A. K. DUTTA GUPTA. (M. H. P.) PAGE 232



Fig. 1.



URETHRAL DIVERTICULUM IN THE SCROTUM WITH CALCULI: I. R. BAZLIEL. (M. H. P.) PAGE 231



Fig. 1.



Fig. 2.

posteriorly by the anterior border of Latissimus dorsi muscle.

Only when there is a distinct deficiency in the extent of origin of these muscles can the triangle

be said to exist.

The hernia is rarely more than a slight bulging. It causes no symptoms. Of whatever variety, the lumbar hernia rarely contains anything but omentum and ascending or descending colon. The sac resembles that of other ventral hernias, being ultimately incorporated with the integuments (the case under consideration differed in this respect). In one case of Russel Howard, the hernia was preceded by the formation of a properitoneal fatty hernia. Strangulation has been described. The hernia is said to be more common on the left side in men.

(b) Behind the posterior axillary line and just beneath the last rib. This is less common of the two although it is a frequent site of a

lumbar abscess.

Traumatic lumbar hernia is commoner than the spontaneous variety. It usually follows:-

- (a) Operations on the kidney owing to transverse division of muscle fibres and frequent necessity for drainage, or suppuration occurring in the wound.
- (b) After opening and drainage of a lumbar abscess.
- (c) After gun-shot injury where efficient repair cannot be effected or suppuration follows repair. A case of traumatic lumbar hernia came to my notice 2 months after a gun-shot injury in the right lumbar region.

The hernia may attain a very large size and the bulging occupies the whole space between the last rib and iliac crest. Patient complains of a sense of weakness in the part which is dis-

abling. Strangulation is rare.

The case under review differed from the usual spontaneous form in the following: (i) it was very big in size, (ii) it did not contain omentum, (iii) it produced symptoms of dragging pain, and (iv) the sac was not adherent in the integuments.

Treatment

I. Spontaneous type—by using a belt with a flat pad over the site of hernia.

If big in size—radical operation with repair

by fascial suture.

II. Traumatic type—by using a suitable belt or re-suture of the wound in layers after dissecting away all scar tissue.

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Therapeutic Notes

NOTES ON SOME REMEDIES

.XX .-- DRUGS IN ANÆMIAS, Part IV

By R. N. CHAUDHURI, M.B. (Cal.), M.R.C.P. (Edin.), T.D.D. (Wales)

Professor of Tropical Medicine, School of Tropical Medicine, Calcutta

II. MACROCYTIC ANÆMIAS

1. Pernicious anamia*

(Low red cell count, macrocytes, normal saturation of hæmoglobin; high colour index; histamine-fast achlorhydria, megaloblastic bone marrow, central nervous lesions are common.)

Treatment consists in supplying the hæmopoietic principle to bring the blood count up to normal level and then to maintain it at this level for life. Intramuscular liver is most commonly used. In the relapse stage when the blood count is low, an extract is injected at first daily, the dose varying from 2 to 5 c.c., then on alternate days until the red cells reach 3 million per c.mm. and thereafter once a week until the normal level is reached. The more concentrated extracts require smaller and less frequent injections. Striking changes in the blood occur with the institution of treatment, and the more anæmic is the patient, the more effective is the action of liver. Reticulocytes start increasing about the third day, reaching the peak within the next two or three days and subsiding again to normal by the fourteenth day. When there is no reticulocyte increase, the dosage of liver should be increased. If still no response occur then probably the preparation is not potent and should be changed. Three or four days after the reticulocytes have begun to increase, the red cell count itself begins to rise with the hæmoglobin lagging a little behind. The increase of red cells is not uniform but is maximum during the first two or three weeks of treatment, thereafter becoming less and less the nearer the count approximates the normal, which it takes about two months to reach. Absence of macrocytes is a good index of the adequacy of treatment, so cell volume determination should be part of routine blood examination. With the changes in the blood there is a rapid improvement in the condition of the patient.

Only in exceptional cases is it necessary to give an initial blood transfusion or liver intravenously. Both can be given together in the

same injection.

^{*} Pernicious anæmia is rare among Indians, but is given in some detail as a general guide to treatment of macrocytic anæmias.

Other drugs.—Some authorities prefer desiccated stomach preparation; it is quite effective so long as the patient can be trusted to take it regularly. Folic acid leads to a well-marked improvement of the hæmatological picture, but is not recommended owing to the incidence of nervous complications in pernicious anæmia when treated with this drug, except for short temporary periods when patients are for any reason unable to take liver injection or have become sensitive to liver extract and are awaiting desensitization. There is no advantage in combining folic acid with liver; the added folic acid is merely wasted away or may cover up an inactive liver preparation. If the red cells do not rise above 3 or $3\frac{1}{2}$ millions or the mean corpuscular hæmoglobin concentration is below 32 per cent, iron should be given in usual large doses. It is a safe rule to give iron as a routine in pernicious anæmia along with the specific therapy. Vitamin C is an important adjuvant to treatment. Dilute hydrochloric acid is a good stomachic and may help when dyspepsia is present. Small doses of thyroid extract effect rapid improvement when hypothyroidism is present.

Maintenance.—The aim should be to keep the red blood cell count at least 41 million per c.cm.; below this level cord symptoms are liable to develop. The best way is to give parenteral liver at regular intervals. The dose varies, but in an average case 5 c.c. of one of the cruder extracts is given every three or four weeks. Regular blood count is as important as the maintenance treatment which has to be continued for the rest of the patient's life. The depot storage method of treatment is of value to patients who cannot come regularly for injection. By it 5 to 10 c.c. of the extract is injected on two consecutive days; this can keep a satisfactory blood level up to two or three months. As regards diet an ordinary mixed diet with high protein is sufficient. If the patient can take lightly cooked liver with it, so much the better. Marmite has some value.

2. Tropical sprue

(Fæces pale, bulky, acid and frothy with increased fat content; achlorhydria or hypochlorhydria; glossitis and loss of weight. In established cases, macrocytic anæmia; colour index is not always high as there may be also considerable iron deficiency.)

The present-day treatment is on the following lines:—

- 1. Controlled diet, viz, high protein, low fat and moderate carbohydrate (for details of diet see Textbooks on Tropical Diseases).
- 2. For macrocytic anæmia, 4 c.c. of crude liver extract, e.g. campolon or plexan, are injected daily for 12 days and thereafter twice weekly till the symptoms improve. Some cases

respond well to marmite but doses must be large. Iron is an essential adjuvant if the mean corpuscular hæmoglobin concentration is low.

- 3. The diet and liver injections should check the diarrhea but if excessive sulphaguanidine is often helpful failing which tinct. opii 10 mins. or codeine $\frac{1}{2}$ gr. is given twice daily.
- 4. Supply any deficiency substances, e.g. dilute hydrochloric acid for hypochlorhydria, calcium lactate if serum calcium is low, nicotinic acid 150 to 300 mg. and riboflavin 3 mg. daily for sore mouth and tongue.
- 5. Treat any complicating disease, e.g. malaria, dysentery and helminthic infection.
- 6. Blood transfusion if anæmia is in very advanced stage.

The above treatment, though a great improvement on older methods, is still not always quite satisfactory. Folic acid has usually a dramatic rapid effect on the gastro-intestinal symptoms within a few days of starting the treatment. Stools and abdominal distension diminish, the soreness of tongue abates and the patient gains in appetite and weight. The radiological pattern of the bowels returns to normal and the excessive irritability disappears. The glucose tolerance curve reverts to a normal shape, but some residual steatorrhea tends to persist and the stools do not become completely normal in many cases. Regarding the blood picture there is no general agreement. According to some English reports the response is good when the anæmia is of the typical megaloblastic type; sometimes further progress can be effected only with liver; in others there is little or no response. On the other hand, the American reports give convincing accounts of the efficacy of folic acid. The difference seems to lie in the two types of cases. The sprue syndrome in the American cases followed a diet long deficient in essential food factors, particularly first-class protein and vitamin B complexes; infection and alimentary infestation was commonly present. They appear to have been due to nutritional deficiency or what is called para-sprue by some. The English cases occurred among Europeans with normal nutrition who had been resident in the East and in whom signs of malnutrition developed during the course of the disease as a result of partial failure of the intestinal absorption. It is therefore difficult to assess the value of folic acid until trial is made in a large series of selected cases. The anæmia associated with sprue is at times known to be somewhat resistant to liver, iron and vitamins. Perhaps folic acid has the same limitations, for even in the American series there was a considerable number of patients whose red cell count could not be brought to the normal level. At present it seems best to give combined therapy of folic acid and whole liver or liver extract in addition to dietary treatment. Folic acid has also been successfully used for maintenance in daily 5 mg.

[Figures 1 and 2 in plate III and figure 1 in plate IV, as published in the February 1948 issue, were wrongly arranged and numbered. The two plates are corrected and republished. Readers are requested to substitute these in the appropriate place.—Editor, I.M.G.]

PLATE III BRONCHIAL CARCINOMA SIMULATING PULMONARY TUBERCULOSIS: I. UNGAR. (M. H. P.) PAGE 83

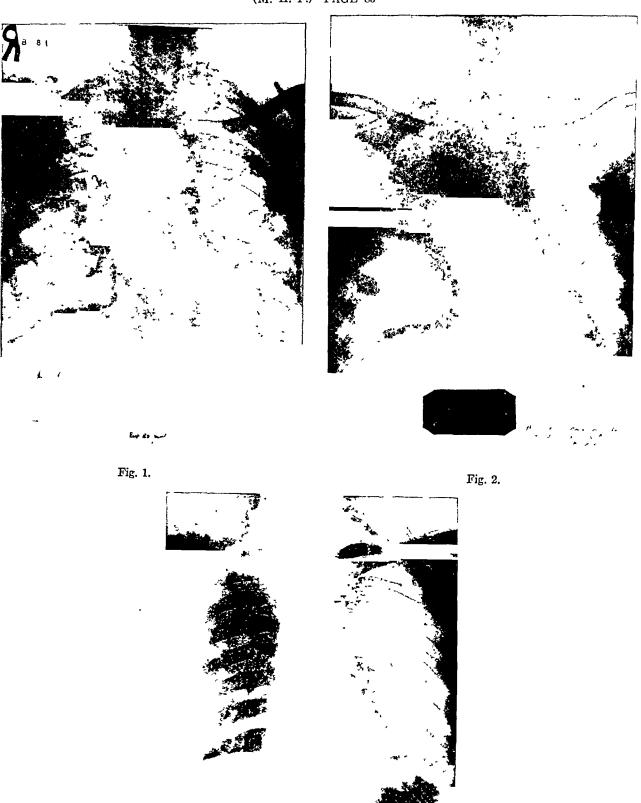


PLATE IV
BRONCHIAL CARCINOMA SIMULATING PULMONARY TUBERCULOSIS: I. UNGAR.
(M. H. P.) PAGE 83

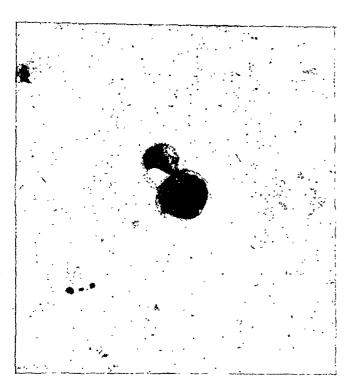




Fig. 4.

Fig. 5.

CYSTIC DISEASE OF LUNG-A CASE REPORT : P. L. DESHMUKH. (M. H. P.) PAGE 84



ADDENDUM

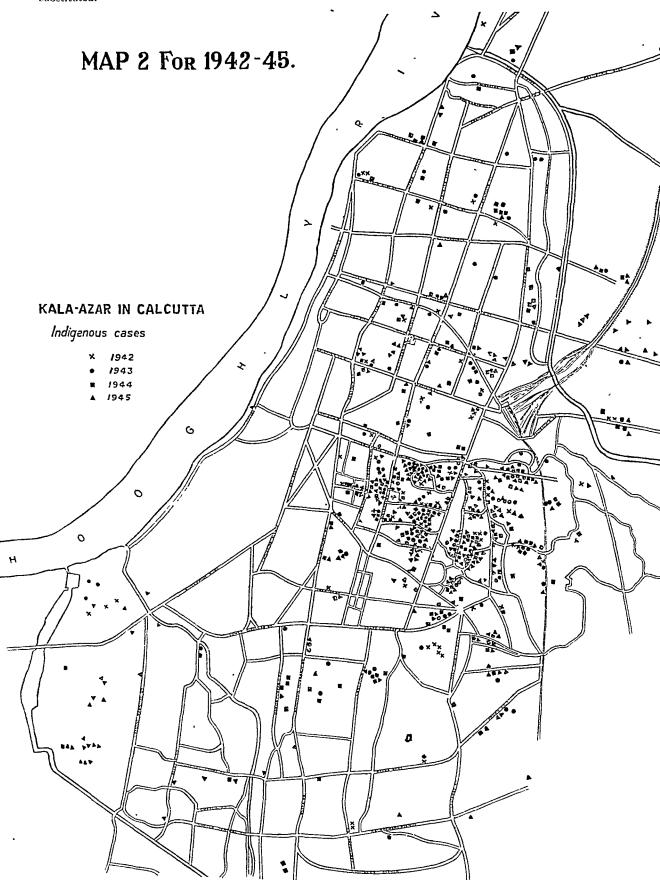
OBSERVATIONS ON AN OUTBREAK OF KALA-AZAR IN CALCUTTA

By P. C. SEN GUPTA, M.B. (Cal.)

Officer in Charge, Kala-azar Research Department, School of Tropical Medicine, Calcutta

Indian Med. Gaz., 82, Dec. 1947, p. 726

In the above article, map 2 on page 728 is not clear. The following enlarged version of it may be substituted.



•		• •	-	

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Indian Medical Gazette

- MAY

MEDICAL MEN AT THE HELM

Capitalists (more politely, industrialists), lawyers and medical men strip men naked for their different purposes. They know exactly what their fellow human beings are capable of contributing, what they have done or what is going to happen to them. At the helm of the ship of State they are likely to act from force of habit. The majority may be exploited for the benefit of the minority, so made to live that the law may be fulfilled or so guided that it lives a healthy and happy life, each giving to each the best that can be got out of the human span of life, including the extension of the span itself, which undoubtedly has been brought about, between the beginning of the first World War and the end of the second, solely by us.

The first two categories of directors of human affairs have thrived in the past in the West. The East started recently with the third category in the person of Dr. Sun Yat-Sen. Our turn has come now. Our medical men are playing their part. Two are Premiers in the two Frontier Provinces. One is taking over the responsibility in an ancient State well known in the princedom of India and in matters of Indian independence. Bhore's report made them philosophers, guides and friends of the masses. Three of them are already leading the classes.

In the past, in all lands, men of God have also directed human affairs directly or indirectly. In the course of human evolution when godliness became more evenly distributed the end purpose of the men of God was fulfilled. Their chairs are almost empty to-day. We can lay a claim to their conjoint occupation also. Humanity makes the closest approach to the Diety in the alleviation of suffering, which is our mission in life. Most founders of faiths gained public confidence by healing, in the first instance.

We wish our professional brethren well in all three places: with the masses, with the classes and in the company of men of God.

INSULIN HYPOGLYCÆMIA

REPORTS of severe hypoglycæmic reactions after protamine zinc insulin have been published from time to time since its introduction in 1937. In view, however, of occasional reports on fatal cases of hypoglycæmia resulting from injections of protamine zinc insulin, a comment on the subject is thought to be necessary.

Although protamine zine insulin possesses several advantages over soluble insulin, its disadvantages must also be kept in mind during its use. One of the main disadvantages of protamine zine insulin is that owing to its

slow, persistent and continuous action, the hypoglycæmia caused by it (during the period of the maximum fall of blood-sugar, i.e. 12 to 14 hours after the injection) is more insidious in origin and the subjective symptoms are less pronounced than those caused by soluble insulin. The usual and early hypoglycemic symptoms, such as tremulousness, sweating, palpitation etc., being thus unnoticed by the patient, it often gives him a false sense of security and on account of the persistence and continuousness of the action, he is likely to develop severe hypoglycæmia without warning, particularly when he is asleep at night. A second disadvantage of protamine zinc insulin is its summation or cumulative effect, on account of the action of one dose lasting sometimes over 36 hours. Thus, the residual effect of a dose given on the previous day combined with the effect of a fresh dose will no doubt enhance its action and may lead to very undesirable results.

It thus appears that in striking contrast with soluble insulin (the hypoglycæmic action of which occurs with almost specific regularity and with specific symptoms) the hypoglycemia caused by the slow and continuously acting process of protamine zinc insulin is more insidious and is more likely to be overlooked in its initial stages. This, happening in a patient during sleep (i.e. 12 to 16 hours after the injection was given in the morning), is likely to make him comatose during sleep without anybody's knowledge. This is the reason why some specialists have advocated giving protamine zinc insulin in the evening, before dinner, instead of before breakfast. It should be admitted, however, that though the grave risks as stated above may be theoretically correct, such accidents seldom occur if the patient is intelligent and alert and if proper instructions given to him regarding the taking of his meals at specified periods are followed carefully and not omitted whimsically or otherwise. It is true that protamine zinc insulingiven at night is likely to prevent the onset of hypoglycæmia, while the patient is asleep at night, but the same risks are there all the same while the patient is absorbed in his work during the day when he is unlikely to notice the early symptoms if they present themselves. He must realize the fact that he has had the injections and be careful himself and keep other people informed about it so that they can notice if the patient is behaving queerly or having 'fits' which, almost always which, almost always, is a marked symptom even during sleep. It should also be remembered that, owing to the slow and progressive action of protamine zinc insulin hypoglycæmia, intravenous injections of glucose have to be given for longer periods than for the hypoglycæmia resulting from soluble insulin where a single injection is often sufficient.

Insulin hypoglycemia is particularly dangerous in coronary diseases. In this affection it really threatens life. This danger is accentuated

when such patients, found in an unconscious state as a result of insulin hypoglycæmia, are given further doses of insulin under the mistaken idea that they are cases of 'come'

idea that they are cases of 'coma'.

To guard against such mistakes it is the practice of some of the diabetic clinics in America to advise their patients to keep an identification card in their pocket on which the following is inscribed:—

(1) I am a diabetic.

(2) Am I in 'insulin shock' or 'coma'?
(3) If sugar, orange juice or sweetened fluids do not cause definite improvement in fifteen minutes, please call a doctor or send me immediately to a hospital.

J. P. B.

In the editorial on 'Plague in India', I.M.G., 83, no. 3, March 1948, p. 139, column 2, line 14, for 'effect' read 'effects'.

Medical News

WHY PEEL?

(Abstracted from the British Medical Journal, 6th December, 1947, p. 917)

AFTER declaring that 'it is essential to eliminate to the maximum practicable extent the wastage that occurs in the peeling and preparation of potatoes in the kitchen', the Minister of Education tells local education authorities in an Administrative Memorandum how to peel potatoes. The Minister asks them to give strict instructions that potatoes should receive the briefest treatment in electric peeling machines 'consistent with rendering them palatable', and that hand peeling and 'eyeing' should be done with special care—indeed, the latter may be omitted if doing so does not cause potatoes to be wasted in the dining-room. The Memorandum adds that potatoes baked in their skins should be served as often as possible and experiments conducted with potatoes steamed in their skins.

ducted with potatoes steamed in their skins.

The proportion of potato removed by peeling has been estimated as between 3 and 25 per cent, an average being 14 to 16 per cent, and these peelings, of course, include part of the cortical layer of the tuber. Moreover, potatoes boiled in their skins lose far less nutritive matter than peeled potatoes cooked in that way, and while there is a food shortage, it is illogical to destroy a barrier that is 'so resistant to high temperatures, and so absolutely impermeable'. Education authorities should try to persuade children to eat

unpeeled potatoes.

WORLD HEALTH TALKS IN LONDON Rôle of Medical Service in Industry By DR. GEORGE GRETTON

(Reproduced from Release No. 614, offered by the British Information Services, Office of the U.K. High Commissioner in India, New Delhi)

'The health of all peoples is fundamental to the attainment of peace and security', declares the draft constitution of the World Health Organization. For some years Britain has realized this, for the great strides she is making towards economic prosperity and social stability can only be maintained if maximum attention is paid to the welfare of her citizens.

During the coming summer two international conferences will be held in London to discuss the health of people all over the world, in their jobs as well as in their homes. In September, doctors from 26 nations are meeting for the first congress since World War II of the Permanent International Commission for Industrial Medicine. Under the presidency of Mr. Winston Churchill's doctor, Lord Moran, they will talk over a wide range, of problems arising from the complexity of modern working conditions in industry, in shops, in ships and on the land.

MENTAL HEALTH

Coal mining and its attendant dangers will naturally loom large on the agenda as will other dangerous trades. Other matters for discussion include clinical

and nursing attention and the effects of environment on working folk.

A month earlier, industrial medicine will also be on the agenda of the International Conference on Mental Health which starts its sessions in August. Mental Health is an extremely broad and important subject. At this conference representatives of 45 countries will be debating questions of psychology, psychiatry and sociology in the hope that they can make some contribution towards helping the ordinary individual, wherever he or she may live. A special section of the conference will consider mental health in industry and

its concomitant problem of industrial relations. It is fitting that London should have been chosen as the meeting place for these health congresses in 1948, for it was just a century ago—in 1848—that the first English Public Health Act became law. To-day we take the responsibility of public authorities for public health services so much as a matter of course, that it is almost impossible to appreciate that so elementary a measure as the 1848 Bill should have produced such a tremendous controversy and outcry. Its opponents belaboured it as the first step towards a revolution, and eminent statesmen warned the nation of the dire consequences which would ensue if these radical health proposals were allowed to become law.

TOTALLY INADEQUATE

Yet, judged by our 20th century standards, the Act was totally inadequate. It set out merely to supply a simple skeleton basis for sanitary services and its provisions, so unpalatably revolutionary to a large part of the population, were mainly concerned with supplying drains and facilities for sanitation and soap.

ing drains and facilities for sanitation and soap.

However, it was a beginning. During the past 100 years nations all over the world have come to accept their responsibilities for public health services and allied activities such as research into, and the practice of, industrial medicine. The great social welfare legislation carried out by Britain during recent years—town and country planning, food subsidies, public assistance measures, family allowances and the new allembracing National Health Act which becomes operative next July—owes its origin to a determined band of now forgotten people 100 years ago. So too does industrial medicine. To-day organizations such as the British Medical Research Council carry on medical research into industry through hospitals and universities in London and many of the large manufacturing centres of the United Kingdom.

of the United Kingdom.

Research and practice of medical science in industry, in common with general public health services, are justified on humanitarian grounds alone. But that they also benefit the nation in a material manner is shown by the fact that to-day Britain's men and women are resolutely setting out to produce more than ever before both for home consumption and export. Yet no one would suggest that there is no room for improvement.

POPULATION SURVEY

A report published during the last few days on the population of Britain advocates many ways in which

the well-being of the people can be further advanced. Issued by a non-party and independent organization called Political and Economic Planning, it covers a wide field of suggestions by which men and women can become healthier and happier at home and at work.

So when delegates from all over the world come to London this summer to discuss industrial medicine and mental health, they should find much in their surroundings to stimulate and interest them. Certain it is that the published results of their deliberations will be of great benefit to doctors and industrialists everywhere.

DECLINE IN MORTALITY IN THE U.S.

(From Advance Release No. FSA-338, offered by Federal Security Agency, U.S. Public Health Service, National Office of Vital Statistics, Washington, D.C.)

Almost all the States shared in the general decline in mortality between 1945 and 1946, according to a statement released to-day by Federal Security Administrator Oscar R. Ewing, summarizing figures of the National Office of Vital Statistics, U.S. Public Health Service. The national crude death rate decreased from 10.6 in 1945 to 10.0 in 1946, and in all but 6 of the individual States the rates for residents also decreased between these years. Increases were seen for: the District of Columbia (which rose from 9.6 in 1945 to 9.8 in 1946), Florida (from 9.8 to 10.0), Idaho (from 9.4 to 9.7), and Mississippi (from 9.1 to 9.2). New Mexico and South Dakota had the same death rate in both years (10.3 and 10.1 respectively).

All figures shown are for the continental United States

and exclude armed forces overseas.

The decreases in the crude death rates were, in large measure, probably due to the large-scale demobilization of the armed forces which began late in 1945 and continued in 1946. The return of military personnel increased the population present in the country. However, since these men were in the young adult age groups, for which mortality rates are normally low, they probably contributed relatively little to the number of deaths.

Resident death rates for the States in 1946 ranged from the lowest rate of 7.5 for Utah to the highest rate of 11.7 in Montana, New Hampshire, and Vermont.
The corresponding lowest and highest rates in 1945
were 7.9 for Arkansas and 12.4 for New Hampshire.
Crude death rates for residents of 5 geographic divi-

sions were lower than the national rate in 1946. These divisions were South Atlantic, East South Central, West South Central, Mountain, and Pacific. The crude death rates exceeded the national rate for residents of the other divisions: New England, Middle Atlantic, East North Central, and West North Central. Each of the divisional rates for 1946 were lower than the corresponding rates for 1945.

In comparing crude death rates, it must be remembered that a relatively high crude rate does not necessarily indicate adverse mortality conditions. These rates are influenced by the composition of the State populations with respect to age, race, and sex, in addition to the mortality risk. For example, the comparatively high rates for the New England and Middle Atlantic States result principally from the relatively older age of the population of these areas.

The death rates shown are computed per 1,000 estimated mid-year population. Rates by place of residence relate the number of deaths among residents

of an area to the population.

FIRST INTERNATIONAL STUDENTS CLINICAL CONGRESS 1948, 6TH JULY TO 23RD JULY

(Received late)

THE British Medical Students Association is organizing in July of this year an International Congress of Clinical Medicine. This is noteworthy as being the first such congress in the world to be organized by

students for students and recently qualified medical practitioners. The Congress is being held in London, Birmingham and Oxford under the Presidency of Professor J. A. Ryle. As the Congress will move successively from place to place there will be no need for the individual members to make a choice as to those things which may be of the most interest—the whole Congress will move.

There will be about 200 delegates, of whom about 150 will come as delegates from more than 30 different countries, so widely separated geographically as U.S.A. and Australasia, India and Burma and Western Europe, Canada, South America and Africa. It will be truly

an International gathering.

The work of the Congress will consist of ward teaching, lectures, films of medical interest, demonstrations, visits to research laboratories and other academic work. Visits to industrial laboratories engaged in work and research of medical interest are also included. Somewhat less professional will be the visits to the theatres and to places of interest in and around the towns in which the Congress is held. The delegates are being welcomed at various receptions by the British Council, the Minister of Health and other important people.

This Congress is being watched with great interest by many other faculties who are intending themselves to organize similar interchanges of knowledge. It is also of considerable interest and importance to all those who are particularly interested in furthering the relations between the nations of the world. Younger people meeting each other have possibly a more open mind and are perhaps more prepared to co-operate, regardless of race or creed, than somewhat older

people.

Further conferences are being planned and it is proposed that the second International Clinical Congress will be held in the U.S.A. and others in other

countries of the world.

This Congress is also planning, if it can raise enough funds, to assist delegates from this and other countries to some extent financially as it is found that in some places, owing to circumstances beyond the students' control-currency regulations, lack of money, etc., a visit to this country as a delegate is impossible without some financial assistance. We are indebted to a number of people who, as individuals or as corporate bodies, have assisted in this respect and we thank those who will do so.

The success of the Congress is, we hope, assured by the very considerable efforts of the organizers both of the work of the Congress itself and the no less important hospitality required. Thanks are also due to those hospitals who are allowing foreign delegates, who can find the time and afford the money to remain in this country after the closing of the Congress, to work and to see for a further period the practice of English medicine.

J. D. REDMILL.

Public Relations Officer to the Congress.

DEPARTMENT OF SCIENTIFIC RESEARCH SET UP

(Reprinted from a Note dated 2nd June, 1948, from Ministry of Home Affairs, Government of India, Press Information Bureau, New Delhi)

The Government of India have set up with effect from the 1st June, 1948, a Department of Scientific Research. The Department will work under the Prime Minister. It will take over the Council of Scientific and Industrial Research, the Board of Atomic Research and State Council and Scientific and and such other functions of the Director, Scientific and Industrial Research which the Government might decide to transfer to it.

It will also co-ordinate the scientific activities of the other Ministries. In its co-ordination work, Department will be assisted by a Co-ordination Com-

mittee consisting of eminent scientists.

Public Health Section

AN ANALYTICAL STUDY OF 1,450 CASES OF RETROVERTED UTERUS WITH SPECIAL REFERENCE TO TREATMENT

By KEDAR NATH DUTT, M.B. House Surgeon, Eden Hospital

and

SUDHIR CHANDRA BOSE, B.Sc., M.B.,
F.R.C.S. (Edin.), F.R.C.O.G.
Professor of Clinical Midwifery, Medical College,
Calcutta

Introductory.—The uterus normally lies in an anteverted and slightly anteflexed position in the pelvis. In erect position, the fundus of the uterus lies nearly horizontal, below a plane connecting the sacral promontory to the top of the pubis and the external os reaches the level of ischial spines.

Apart from the tone of its own musculature and the intra-abdominal pressure acting on its posterior wall, this position is maintained primarily by the strong ligamentary supports, radiating outwards from the cervix. The musculo-fascial layers of pelvic diaphragm act as secondary reinforcement or buttress.

The uterus is retroverted when the fundus falls behind this normal anatomical plane. If the body also bends backwards at the level of internal os, the uterus is both retroverted and retroflexed. Both these conditions are often found associated. Once retroversion begins it becomes gradually pronounced as the line of action of abdominal pressure is transferred to its anterior surface. So, in a late case the infravaginal portion of cervix is directed upwards and forwards and body of the uterus occupies the posterior pouch. Retropronation or retrocession of uterus should be recognized as a separate entity, where the uterus is pushed backwards as a whole and often it is anteflexed and under-developed.

There are few subjects in gynæcology which have attracted so much controversial arguments as that of a retroverted uterus. There are many who believe that a retroverted uterus per se does not produce any symptom and so any treatment for such a condition is unwarranted; while others never leave a retroverted uterus as such as they attribute all the symptoms in the patient to this condition. In this paper observations made on a study of 1,450 cases of retroversion, attending Eden Hospital, during a period of 5 years, are

Incidence.—The incidence of retroverted uterus is far greater in Bengal than that in America or in Western countries. This is mainly due to the general lowered health of the womenfolk of

Bengal with consequent laxity of ligamentary supports, lack of proper supervision during labour and postnatal period and to the general ignorance or reluctance to follow the principles of social hygiene. In Western countries one out of six possesses a retroverted uterus, while in Bengal, it is found in one out of four examined.

Ætiology.—Many women are born with a retroverted uterus. This is ascribed to improper development of ligamentous supports and also sometimes to under-development of uterine musculature. This congenital type comprised about 30.5 per cent of our cases and deficiency of proper diet and exercise made the condition worse. This is also called 'uncomplicated' type of retroversion as there are no signs of disease in other pelvic organs.

In contrast to the above variety, many instances of retroversion are met with, where the position is acquired. Associated pelvic lesions are present in many cases. Three clinical types of acquired retroversion are generally encountered.

After childbirth there is a tendency of a heavy bulky uterus to 'fall' backwards. There is often subinvolution with a mild degree of infection. This is noticed particularly in patients after a difficult or instrumental delivery or who are generally asthenic. The laceration of soft parts and subsequent infection complicate the picture. They comprised no less than 39.5 per cent cases in our series. Lack of proper postnatal supervision and the present system of discharging a puerperal mother too early from the hospital have materially increased the number of these cases.

As a result of aftermath of pelvic peritonitis, tuberculous infection or endometriosis, the uterus may be 'pulled' back by adhesions—flimsy or dense—according to the nature of infection. In recent times, owing to the introduction of chemotherapy and antibiotics and to the awakening of better knowledge about personal hygiene, there is a definite fall in the number of these cases. Even then they include 22 per cent of our cases.

Uterus may be found retroverted due to the presence of tumour, fluid, blood or any exudate in front of the uterus, when it is simply 'pushed' back. This was noted in 8 per cent of our cases. It is questionable whether a normal uterus can deviate backwards due to a heavy fall on the back, though many appeared with this story.

Pathology.—Under-development of uterus along with other signs of endocrine imbalance may be found in some cases of congenital retroversion. In this series one woman out of four, who belonged to this type, presented this picture.

In acquired variety the uterus is often bulky, congested and hypertrophied. This was noticed in nearly every case where history dated from a difficult labour. Moreover, this type of retroverted uterus may be the first stage of prolapse. The uterus was definitely displaced backwards in 90 per cent of women, who attended hospital for genital prolapse—even in its earliest stage.

Along with a retroverted uterus the ovaries are often found prolapsed in the posterior cul-de-sac. These ovaries showed evidence of congestion, enlargement and small cyst formation in about 62 per cent of the cases. The ovarian ligaments were elongated in many

instances.

As a result of abnormal circulation and increased congestion the pelvic veins may be tortuous and dilated. Broad ligament varix was noticed in 30 per cent of women who had to be operated for retroversion.

In most cases of retroversion the bladder is at a lower level and adhesions may form if the uterus be fallen back for a long time. The uterosacral ligaments may be tense and tender

on palpation in many instances.

Diagnosis.—The diagnosis of this condition does not present much difficulty. Mistakes can occur if the bladder and bowel are not emptied during examination. The infravaginal portion of the cervix is directed upwards and forwards but this should not be always counted as the index of retroversion. During bimanual examination there is a feeling of emptiness in the anterior pouch in between the examining fingers and fundus is found when palpation is made posteriorly. When the result of vaginal examination becomes doubtful simple rectal or abdomino-recto-vaginal palpation will greatly help in the diagnosis. Anæsthesia may be necessary in a fat subject to demonstrate the mobility of the organ. Sounding the uterine cavity as an aid to diagnosis is not recommended for there are definite risks of trauma and ascending infection.

Instances are common when a retroverted uterus is discovered as a matter of coincidence and does not produce any symptom or discomfort in the patient. Nearly 28 per cent of the total number of cases in this series did not exhibit any of the typical symptoms of retroversion. They belonged mostly to the congenital

variety.

Symptomatology.—Backache is the most common symptom of retroversion. This was the complaint in 80 per cent of women who appeared with symptoms. The pain is of the nature of a dull ache and may radiate to the front of the lower abdomen or down the back of the thighs. This is due to increased pelvic congestion resulting in varicose condition of veins in some cases and also to the pressure exerted by a retroverted uterus. Pain becomes more intense in the premenstrual phase of menstruation and continues during the first day or two of actual flow.

Various orthopædic conditions may be the cause of pain felt in the small of the back and so a proper diagnosis of the underlying cause should be made before one launches to correct a retroverted uterus.. One should consider the mental make-up of a woman while eliciting this symptom. While Howard Kelly and others call a 'vaginal pessary—an obsolete instru-ment' we have found its application a useful adjunct in determining whether backache is the result of retroversion proper. When its application is possible, if pain be relieved by its employment, all causes other than retroversion can be ruled out. With this 'Pessary Test' we discovered that in about 18 per cent the cause of backache was anything but a retroverted uterus.

Functional disturbances of menstruation either of the nature of menorrhagia, dysmenorrhæa or polymenorrhæa were the main complaints in about 61 per cent of our patients. Menorrhagia is due to the abnormal or hyperactivity of the ovaries to increased pelvic congestion and also probably to the presence of congested and ædematous endometrium. In acquired variety dysmenorrhæa is of congestive type when pain is dull and premenstrual in character. Correction with pessary often relieves many of the symptoms.

In an under-developed congenital retroverted uterus, oligomenorrhæa, hypomenorrhæa, spasmodic type of dysmenorrhæa and sometimes inter-menstrual pain were the various symptoms noted in this series. They were due to the underlying imbalance of the sex hormones and

not to retroversion proper.

Dyspareunia was present in 12 per cent of the cases. In nearly every case either one or both ovaries was easily palpable in the pouch of Douglas and seemed slightly enlarged.

Leucorrhœa is included as one of the main symptoms of retroversion. This was present in two out of three women who attended hospital. They belonged in most cases to the acquired variety. But along the pelvic congestion, associated endocervicitis, low grade of infection in the corpus, or signs of chronic pelvic infection was present in many of these patients. Leucorrhœa, when a symptom in women with uncomplicated retroversion, sometimes showed other signs of ovarian dysfunction.

In none of the cases could we trace permanent sterility to be a result of simple retroversion. In most instances either the male partner was at fault or there were manifestations of endocrine imbalance or association of other complicating pathological lesions. 18.5 per cent of the cases complained of repeated abortions between the tenth to twelfth week of gestation, delayed conception or one-child sterility. Conception when delayed may be explained in some cases by the abnormal upward and forward direction of the cervix and thus away from the accumulated spermatozoa in posterior fornix. Abortion at first or second

month of pregnancy can seldom be due to a simple retroversion.

In this series 52 per cent of women suffering from retroversion after a difficult confinement complained of 'something dropping down' when walking or straining or a constant 'heavy' or 'dragging' feel in the pelvis. Only 3 per cent of congenital type had this trouble. In most instances there was definite evidence of prolapse though in its early stage but in some there was no actual descent on straining. These latter belonged to the so-called group of 'functional prolapse' which if not treated at proper time might lead later to definite herniation.

Constipation or vague nervous symptoms as complained by many were present about equally, both in anterior and posterior position of the uterus and so could not be taken as symptoms of retroversion as advocated by some gynæcol-

ogists.

Prophylaxis.—The ætiological factors definitely prove that preventive treatment has a great place in the cure of early retroversion. Many operations can be avoided if treatment is carried out before the uterus takes up a permanent backward position. There may be little or no complaint at the commencement but later all the typical symptoms appear.

Little can be achieved in the way of prevention for congenital type of retroversion. But there may be relief of symptoms if proper diet, moderate exercise, careful administration of endocrines and treatment of general health be

followed.

Routine postnatal examination lasting up to 6 to 8 months after childbirth can detect the fallen' back uterus in time. Correction of the position of a puerperal bulky uterus with a well-fitting pessary, treatment of associated pelvic lesions and regulated exercise can prevent a permanent retrodisplacement of uterus in most cases. The use of pessary is not recommended as a means of correction of an ordinary retroverted uterus but its application for a period of 8 to 12 weeks in a recent case after childbirth is gratifying in most cases.

Similarly many of the acquired retroversion when the uterus is 'pulled' back posteriorly by adhesions, as a result of chronic pelvic inflammation, can be prevented if adequate treatment is carried out after the first attack of ascending infection and if the couple be properly taught to

avoid re-infection.

Treatment.—One should be conversant with the ætiology and symptomatology of retrodisplacement of the uterus before one undertakes

any treatment for correction.

Congenital retroversion of uterus which causes no symptom does not call for any active treatment. Simple measures to improve general health are sufficient in most cases. Marriage and pregnancy are the best physiological stimuli for its growth and subsequent correction.

But when such a case appears with symptoms the gynæcologist has to exercise with care his judgment and experience. Operative correction of position of this uterus; as a general rule; does not produce the desired effect. When disturbances of menstruation or sterility are associated with an under-developed but retroverted uterus, the whole treatment should be directed to correct the endocrine imbalance and the cycle of ovulation which are the common underlying factors.

When women with properly developed but uncomplicated type of retroverted uterus complain of definite symptoms like delayed conception, repeated abortion, functional disorders of menstruation, etc., each case must be judged individually. Ordinary routine measures to improve her general hygiene, employment of endocrines or dilatation of cervix with insufflation are not enough to cure all cases. Operative correction produced complete relief of these symptoms in about 62 per cent of those cases, where a long, continued, general or hormonal treatment was of little benefit. Moreover, the latter should not be persisted too long, as there is the latent danger of degeneration of ovary, endometriosis and formation of adhesions in a long-standing retroverted uterus. The operation results for this group of cases show that active treatment of correction should not be long postponed in the tropics where the average duration of life is short and the fertility period in a woman begins early and ends early.

In this hospital 81 per cent of operations for retroverted uterus were performed in acquired variety when women presented themselves with definite symptoms. Treatment of coincident lesions in the pelvis was carried out at the same time. It was strange that patients who complained of troubles relating to other diseases in the pelvis were not completely cured until the backward displacement of uterus, if present, was corrected. Whenever the uterus was replaceable, 'Pessary Test' was employed. Operation was performed when symptoms recurred after removal of the pessary.

In selected cases, operative result was uniformly good. There was partial relief of symptoms in 8 per cent. These failures were due in most cases to wrong selection of a case for operation or where uterus and adnexa were buried in dense adhesions or to a faulty technique in actual operation.

It was observed that in a young woman where the uterus was retroverted with a slight degree of descent and a small cystocele, abdominal reposition of the position of uterus greatly reduced the recurrence rate of prolapse after future childbirth than an elaborate plastic operation carried out vaginally for the same purpose.

In this hospital, during the period of 5 years, ventrosuspension of uterus per abdomen was the operation of choice. In 92 per cent of operations performed the uterus was suspended forwards by anchoring the round ligaments to the abdominal parietes following the technique of Gilliam or Olshausen. Only in 6 per cent

uterus was kept anteverted by suturing the loops of round ligaments to the back of the corpus as in Webster-Baldy or by simple reefing/shortening of round ligaments. In the rest the anterior surface of the uterus was sutured to the parietal peritoneum. More recently shortening of uterosacral ligaments and advancement of bladder were supplemented in about 5 per cent of operations for suspension.

Extraperitoneal shortening of round ligaments as advocated by Alexander-Adams and vaginal suspension or slinging were discarded for obvious

children.

In older women at the end of child-bearing age a retroverted uterus sometimes had to be removed when this was found fibrotic or involved in a tumour.

While performing any of the operations of reposition, danger of strangulation of bowel within the loops formed inside abdomen, chance of recurrence after childbirth and any deviation of the normal function of the organ were always considered carefully. Under or over-correction of the organ was avoided.

In most cases of retroversion where uterus was sutured to parietal peritoneum the growing fætus occupied the posterior sacculation of the organ and labour was difficult in almost every instance due to a change of axis in the uterine contraction. There was recurrence of previous backward position in 60 per cent of operations where uterus was brought forward following the technique of Webster-Baldy. This proved that the lateral portion of the attenuated round ligaments, as employed in that operation, were not sufficiently strong to maintain a top-heavy puerperal uterus in its proper position. On the other hand, the uterus was found more anteverted and anteflexed in some cases where this was slung forwards as in Olshausen's operation by suturing the proximal portion of round ligaments to the lower part of rectus sheath. Post-operative troubles in urination and persistence of pain during menstruation were met with in 28 per cent. So, more recently, suspension of uterus to the parietal peritoneum, Webster-Baldy or Olshausen was seldom performed in a

Gilliam's method to correct a retroverted uterus as modified in different clinics has stood the test of time and trials of pregnancy. It offers best post-operative and functional result. and the recurrence rate is minimum. Modifications mainly consist in extraperitoneal delivery of the strong proximal portion of each round ligament and in the selection of a suitable site of their anchorage on the abdominal parietes. The steps of this operation, as carried in this hospital, will be described in more detail.

young woman who had every chance of bearing

Abdomen is opened either by a paramedian or transverse incision. Uterus is replaced in a proper anatomical position after separation of adhesions, when present. With little dissection the aponeurosis of external oblique muscle at the lower part of the incision is exposed and a small opening made on it midway between external and internal abdominal rings. With the help of Lucas' nephrectomy needle the loop of each round ligament at about 12 inches to 13 inches from the uterine cornu is led out through this This is made to traverse a path between the layers of broad ligament, behind the parietal peritoneum and through the inguinal canal. The loop is then sutured with the pillars of this opening with fine silk but all through this stage a close watch is maintained to prevent any over/under correction as in Olshausen or Webster-Baldy and also to avoid any kinking of the inner end of the fallopian tube. Previously, silkworm gut was used as a suture material but this was found to ulcerate out in a number of cases. Perfect hæmostasis is obtained at or near the site of anchorage to prevent any formation of hæmatoma under sub-

cutaneous fat and later fibrosis.

Thus in this modified operation as compared to that of Webster-Baldy the uterus is kept forwards by the strongest portion of each round ligament. Unlike that in Gilliam or Olshausen as each ligament is made to retrace its own normal anatomical route the pull on the uterus is exerted along a forward and lateral direction imitating exactly that of a normal round ligament. Moreover, in this process, as the round ligaments are fixed to the external oblique aponeurosis instead of the rectus sheath, no lateral compartment is produced in the abdomen through which strangulation of bowel may occur. Only in 3 per cent to 4 per cent there was a tendency of the uterus to fall back and in 7 per cent the patient complained of a 'pull' or 'drag' at the lower end of abdominal incision. Lately, the recurrence rate has been further reduced with advancement of bladder and apposition of lax uterosacral ligaments in cases of bulky and hypertrophied uterus. There was no instance of formation of hernia or of intestinal obstruction after any such modified technique.

Summary

Observations are recorded on an analysis of 1,450 cases of retrodisplacement of uterus.

Its incidence is greater in Bengal than in Western countries and is about 25 per cent. This is mainly due to the lack or reluctance to carry out adequate prophylactic treatment after childbirth or after pelvic inflammation.

Uterus may be retroverted from very birth but in the majority this is acquired. The latter are often complicated by other pelvic lesions. Congenital retroversion was noted in 30.5 per

The ovaries were often prolapsed along with a retroverted uterus and were found congested, enlarged and to contain small cysts. Broad ligament varix was met with in 30 per cent.

Nearly 28 per cent had no symptom or complaints due to retroversion. The rest suffered either from backache, functional disturbances of menstruation, leucorrhea, prolapse, delayed conception, etc. 'Pessary Test' was found a useful adjunct for elucidation of some of these symptoms which were directly due to the retroversion of the organ.

Operative treatment was carried out only in those cases where the symptoms were definitely due to the backward displacement. They were mostly performed for acquired retroversion. In congenital variety every case was judged individually before any active treatment was undertaken.

Ventrosuspension of uterus per abdomen, e.g. modified Gilliam, was the operation generally performed. The proximal portion of each round ligament was delivered extraperitoneally and anchored to the aponeurosis of external oblique near about the midpoint of inguinal canal. Thus the pull exerted on each cornu of the uterus was along the anatomical direction. The recurrence after this operation was minimum and no instance of strangulation of bowel or herniation was recorded.

Our thanks are due to the Superintendent, Medical College Hospitals, for allowing us to publish the figures and also to our colleagues of Eden Hospital, who helped us with case records.

LABOUR ABSENTEEISM

By K. L. BASU MALLIK, M.B. (Cal.)

Medical Officer in Charge, Ludlow Jute Company
Limited, Chengail, District Howrah

and

S. D. S. GREVAL LIEUTENANT-COLONEL, late 1.M.S. School of Tropical Medicine, Calcutta

During the month of November 1947, an accurate observation was made to find out the loss of days by unskilled and skilled labour employed, from medical and non-medical causes. The observation covers all the labour employed by Ludlow Jute Company Limited, operating three mills at Chengail in the district of Howrah. The skilled labour consisted of:—

Mechanics and fitters, Weavers, Spinners,
Rovers,
Bale carriers,
Electricians and
other mechanical operators.

The unskilled labour consisted of :—
Mechanics' helpers,
Transport labour,
Gardeners,
Sweepers,
Water carriers and
other daily coolies.

The total consisted of:-

Skilled labour .. 2,512 Unskilled labour .. 3,300

Total .. 5,812

The exact time lost from medical causes was recorded by the medical department in the sick leave forms. Exceptionally, in a very small percentage of cases, it was possible that the sick person fell ill in his village home and did not turn up for some time. But these cases are always afterwards covered by medical leave certificates granted by private practitioners which are taken notice of by the company's medical department.

Received the figures for leave from nontermination the Labour Bureau collected the records from their employment cards and departmental records.

It would appear from above figures that medical leave days per case were about the same for skilled and unskilled labour. This is quite natural as this depends on the nature of prevailing sickness and not on the person's status.

Proportionally more unskilled labour (14.1 per cent) took medical leave against 8.5 per cent for skilled labour. Similarly, more skilled labour took non-medical leave (12.3 per cent) against 8.6 per cent for unskilled labour. Regarding the length of leave from non-medical causes there was a good deal of difference, namely, 16.1 days for skilled against 26.0 days for unskilled labour.

Table
Showing absenteeism figures in November 1947

	Total employed	Number taking leave	Percentage of labour taking leave	Total days of leave taken	Leave days, per case
Skilled Unskilled Skilled Unskilled	2,512 3,300 2,512 3,300	309 285 216 463	12.3 8.6 8.5 14.1	4,994 7,422 749.5 1,525.5	16.2 26.0 3.5 3.3

Table
Showing absentecism figures in March 1948

		Total employed	Number taking leave	Percentage of labour taking leave	Total days of leave taken	Leave days, per case
Non-medical grounds Medical grounds	Skilled	2,593	856	33.0	5,250	6.1
	Unskilled	3,372	1,329	39.4	7,682	5.8
	Skilled	2,593	155	5.98	559	3.6
	Unskilled	3,372	254	7.53	768	3.0

The month of March is one of the best months so far as sickness incidence is concerned. This is also the month corresponding with the half of the last month of Bengali year, namely, the first fortnight of Chaitra.

Absenteeism during March 1948 appeared to begin more towards the second half and the leave period shorter.

It appears that percentage of labour taking sick leave is less than in the month of November, but the average absentceism from sickness remains about the same. This is expected as the causes of sickness remain practically the same for both months from non-medical causes. The number of men taking leave in March is much higher in both groups than in November, namely, 33.0 and 39.4 per cent against 12.3 and 8.6 per cent respectively, but the average number of days of leave is lower, namely, 6.1 and 5.7 days against 16.1 and 26.0 days.

November being the month of paddy cutting one would expect an exodus but it is a fact that a very small percentage of labour particularly the stabilized labour of jute mills have lands of their own under their own cultivation. Some of them certainly go to collect the 'bhag' (share).

The causes of men taking leave in March are three:—

(1) The termination of their 'sannyasa' which takes place by middle of April. (2) Repair to their thatches and homesteads. By this month the paddy has been thrashed and straw is available easily to re-thatch their houses before the commencement of rains. (3) The payment of the annual land rent and taxes at the end of the year. It is an important cause. Combination of all these factors make larger number of labour take leave during March.

The leave period for labour is usually 2 to 12 weeks but in March it is usually taken during the second half corresponding to the month of Chaitra (first 15 days) so that less days have fallen in March and this accounts for the less number of days of leave per case, viz, 6.1 and 5.7 respectively.

The leave is taken more for non-medical than medical reasons. Of this non-medical leave more is taken by the unskilled than the skilled labour. The medical reasons for taking leave are the same for the unskilled and the skilled labour and do not constitute a problem in labour.

ERRATA

A SHORT NOTE ON PLAGUE CASES TREATED IN CAMPBELL HOSPITAL

By A. K. DATT GUPTA, M.B., D.T.M. Superintendent, Campbell Hospital, Calculta

(I.M.G., 83, March 1948, p. 150)

In column 2, para 7, for 129 read 132. In the table under para 7,

 for Bubonic
 84
 35
 119

 read Bubonic
 97
 21
 118

In the third line from the bottom for 7 deaths read 4 deaths.

The Indian Medical Gazette fitty Years Ago

LONDON LETTER

(Reprinted from the Indian Medical Gazette, Vol. XXXIII, May 1898, p. 188)

A FRESH attack has been made on the doctrine of the dynamic causation of disease. Forces cosmic, telluric, meteorological, thermic, electric, and what not, have been assigned at one time or another, a primary agency in the causation of acute infections, more especially when these manifest themselves in the shape of epidemics. One by one these diseases have been removed from the domain of astrology, and the tendency in these days is to postulate for them toxins as primary causes and to assign to these dynamical agencies a secondary causal function adjuvants. The discovery of virulent microparasites, capable under favouring circumstances of turning the pieces of the body into poisons, has revolutionized pathology and resuscitated in a new form the ancient humeral theory of pathogenesis. The influence of excessive heat in the production of those serious disturbances of function, known as heat exhaustion or syncope, sunstroke or insolation, heat asphyxia, thermic fever, heat apoplexy, and so forth, has been till now claimed as a typical and undisputed instance of severe and fatal acute disease due to dynamical action. The idea of insolation being of microbic origin would seem to be a thesis of the utmost

improbability; yet it has been seriously propounded and deliberately argued in a very interesting and able paper contributed by Dr. L. Westenra Sambon to the last (March 19th) number of the British Medical Journal. Dr. Sambon does not entirely banish heat from the category of causes originating the serious effects which have been enumerated; but he. denies the sole primary or principal agency of heat in producing them. As regards heat exhaustion, syncope or shock, he allows that heat has some share in giving rise to the symptoms, but argues that other conditions, such as organic heart disease, alcoholism, fatigue or ill-health, however induced, constitute the real and chief reason why an individual exposed to excessive heat succumbs to it and faints. Heat, in such cases, is one of a group of causes, and the main factor is not the heat per se, which a sound organism would be perfectly competent to endure unscathed, but the impaired power of resistance possessed by the damaged constitution. There can be no doubt that healthy animals and healthy human beings above all others can survive for short periods very high degrees of heat, and are capable of adaptation to prolonged exposure to lower but still excessive temperatures, and that impaired resistance, however caused; is an important element in upsetting function in these cases. We are disposed to think that Dr. Sambon is too much inclined to minimize the heat factor and exalt the factors which produce impaired resistance. Indeed, continued exposure to excessive temperature or prolonged residence in a hot place may and probably does constitute the chief source of impaired resistance by disturbing function and reducing power. Cases of heat syncope, especially those induced by direct exposure, cannot by any process of reasoning be brought within the toxic or microbic fold, and must still remain in the dynamic domain. It is the cases of heat fever or hyperpyrexia that Dr. Sambon claims to be of toxic and probably of microbic causation. To this class of cases he proposes to restore the old name of Siriasis (from Sirius, the dog-star), and he describes the symptoms, morbid anatomy, pathology and epidemiology of this condition from the toxic or microbic point of view with great ingenuity and some force. Even here he is compelled to retain heat in the category of causes; but he looks upon it simply as a condition favourable to the elaboration of the toxin, which he holds to be the essential cause of the hyperpyrexia and other associated with it. He discards all previous theories as insufficient to account for the phenomena, which he ranges with those of other acute infections, such as typhus, relapsing, cerebro-spinal fevers, etc. He does not believe in excessive heat production, or impaired heat dispersion, or disturbed balance between the two, being of themselves competent to account for the symptoms, and throws doubt upon the existence of a heat regulating centre. Even

admitting the toxic theory, it is difficult to dismiss some such mechanism, and if a toxin, elaborated by microbes, can disturb thermogenesis and thermolysis, why should not a toxin of some other description or origin, due, say, to some derangement of vital chemistry, also give rise to similar disturbance, and is it quite certain that the presence of a toxin in the body is necessary to produce pyrexia, or even hyperpyrexia? There are other things, such as tension, exertion, emotion, mechanical irritation, etc., which elevate the temperature and the nervous element cannot be banished from the fever process, whether there is a separate heat regulating mechanism or not. The epidemiological side of the demonstration is even weaker than the pathological, and the analogy between heat fever and other fever is very strained. No doubt there are cases of sun fever, which are erroneously so called; for example, pernicious malarial fever may very easily be mistaken for insolation, and has unquestionably often been Sambon's so. Dr. paper ought to lead to careful re-investigation of the whole question of thermic fever. It is quite possible that the thermic element may be superimposed upon other conditions and diseases. rendering the individual more prone to succumb to thermic influences, and those other detrimental states, such as overcrowding, fatigue, thermic exhaustion, defective sanitation and vital depression of all sorts, which have always been held as constituting important auxiliaries. But the position that 'sunstroke (siriasis) is not heat fever, but an infectious disease' appears to be a very doubtful one and not sufficiently supported by the evidence and considerations adduced in this paper. At the same time, the dynamic theory has received a strong blow, and though we must admit that vital dynamics must be potent alike in health and disease, the precise manner in which physical dynamics outside the body modify those that are inside of it, cannot remain the subject of vague assertion as hitherto, but must be worked out by means of those more searching methods which modern science has placed at our disposal. It remains quite true that all the forces which have been mentioned must and do correlate and affect those subtle forces on which the manifestations of life in health and disease depend, but a still profounder truth is that force is a mere evidence and outcome of material change-of matter in motion -and it is to the changes and motions of matter that our attention must be principally turned. Among these changes and motions, the life history of morbific parasites, and the destructive alterations which they bring about in the fluids and solids of the body, occupy a very prominent place, but it is somewhat unphilosophical to postulate a particular parasite and toxin, when not a tittle of evidence exists that there is in nature either one or the other.

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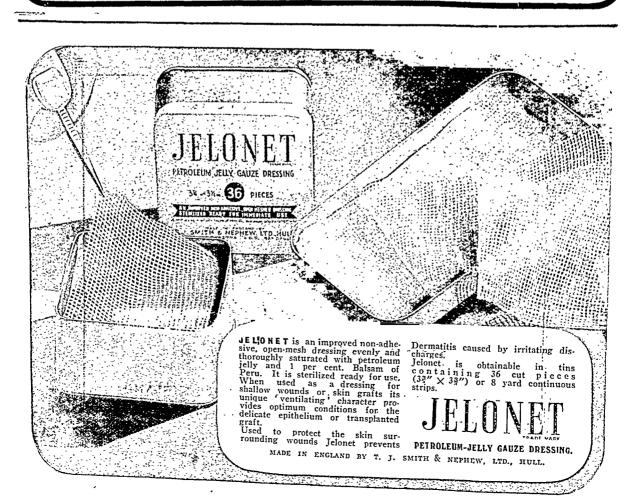
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Current Topics, Etc.

Herniated Intervertebral Disc: Analysis of 90 Cases

(Reproduced from Surgical Newsletter W-586, dated December 1947, distributed by the U.S. Information Service, Calcutta)

PETTON AND SIMMONS analyse 90 cases in which operation was performed for herniation of a disc. The disc was considered pathologic only in cases in which a loose fragment of disc tissue was observed lying free in the spinal or in which there were definite bulging and spontaneous protrusion of nuclear material when the annulus fibrosus was opened. In all others the disc was considered normal and the results of operation recorded as negative. Eighty pathologic and 10 normal

discs were exposed at operation.

55, 271–287 (Sept.), 1947.1

During part of the period spinal fusions were not performed after removal of lesions of the disc, and during the rest of the period fusion was done in every case after removal of the lesion. The relief obtained was essentially the same with simple removal of the lesion as with removal and spinal fusion. The results were satisfactory in the group of 80 cases in which a definitely pathologic disc was removed. Seventy-two of the patients were followed, and only three had continued pain or disability of unknown origin. The results were not good in the 10 cases in which exploration was considered to have revealed no lesion of the disc. This would indicate that simple removal of the lesion of the disc is a satisfactory operation and that improvement in results is likely to be realized through better selection of cases for operation rather than through the introduction of new operative procedures. [Peyton, W. T., and Simmons, D. R.: University Hospitals, Minneapolis 14, Minn. Archives of Surgery,

The following seven items are reproduced from Medical Newsletter No. W-587, dated December 1947, distributed by the U.S. Information Service, Calcutta.

Use of Penicillin in the Treatment of Carriers of Beta-Hemolytic Streptococci among Patients with Rheumatic

GOERNER and her associates say that since there are inherent difficulties in evaluating the innocuousness of a given strain, every carrier of beta-hemolytic streptococci must be considered a potential menace to a population of rheumatic-fever patients. Prolonged isolation of such carriers is inadvisable from the psychological standpoint and is usually impracticable. Hence, means of abolishing the carrier state are desirable.

Many investigators have found penicillin to be a more effective agent than sulfonamides for the treatment of hemolytic streptococcus respiratory infections. ment of hemolytic streptococcus respiratory infections. From these reports it also seems that during penicillin therapy hemolytic streptococci disappear from the nose and throat in nearly all cases. After the discontinuation of treatment the organisms have reappeared in a varying proportion of cases, depending apparently on the dose of penicillin and the number of days of treatment.

With a view to preventing the spread of hemolytic strentococci from one patient to another, penicillin has

streptococci from one patient to another, penicillin has been administered to patients at the House of the Good Samaritan found to have positive throat cultures. Extract of case histories given by the authors illustrate the need for the elimination of beta-hemolytic streptococci from the upper respiratory tract of carriers.

Eighteen chronic carriers of beta-hemolytic streptococci and two cases of acute streptococcal tonsillitis were treated with a total of 1,200,000 units of penicillin each, given intramuscularly during ten days.

In 17 cases the infecting organisms were eliminated permanently from the throat cultures. One group A streptococcus and two that did not belong to group A,

C or H failed to disappear.
In five cases in which tonsillectomics were performed 125 to 185 days after treatment, the tonsillar fossæ and sectioned tonsils were free from hemolytic streptococci.

In two cases the antistreptolysin O titres did not rise after acute streptococcal infections that were promptly treated with penicillin. Penicillin injections once daily for ten days in slowly absorbable form were observed to be successful in eliminating the beta-hemolytic streptococcus carrier state in five or six cases.

The ability to eliminate beta-hemolytic streptococci from the throats of most patients in close contact with persons who have had rheumatic fever suggests a practical method of protecting the latter group from beta-hemolytic streptococcus infection.

It is evident that further observations are needed to ascertain whether prompt penicillin treatment for acute hemolytic streptococcus infections in subjects with rheumatic fever may decrease the likelihood of a

recurrence of rheumatic fever.
(Goerner, J. R., Massell, B. F., and Jones, T. D.: New England Journal of Medicine, 237, 576-580, 16th

October, 1947.)

Tuberculous Tracheobronchitis: A Study of 500 Consecutive Cases

Jupp of the Pennsylvania State Sanatorium says that the establishment of routine endoscopic examination of all patients who are under consideration for major surgical collapse therapy for pulmonary tuberculosis, has made it possible to accumulate such valuable information regarding tuberculosis, endobronchitis and tracheitis and to observe the effect of treatment on this

Among the important facts that have been brought to attention are: (1) the progressive nature of the morbid changes that culminate in a strangulating stenosis; (2) the value of treatment in interrupting this chain of events; and (3) the value of individualization

of therapeutic methods.

The observations presented by Judd were made on 500 cases. The greater number of patients examined revealed some inflammatory reaction suggesting that the more severe conditions have their origin in this single inflammatory process. The process thereafter is a gradually progressive one. The area involved becomes more and more extensive and may end in severe stenosis or total occlusion of the airway. The fact that every tuberculous patient does not develop such a strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extensis in the fact that the strangulating extension is the strangulating extension and the strangulating extension in the strangulating extension in the strangulating extension in the strangulating extension and the strangulating extension in the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension is a strangulating extension and the strangulating extension as a strangulating extension and the lating stenosis is proof that natural resistance processes interrupt this chain of events in the majority of cases. In addition, careful bronchoscopic management will interrupt many more. Thus, the ultimate number of patients developing a strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction will be sufficiently in the strangulating stenosis or obstruction of the strangulating stenosis or obstructions. tion will be small in terms of the general tuberculosis population.

If an ulcerative process occurs in either the trachea or bronchus, a contemplated collapse procedure may of necessity have to be postponed. Such a postponement may easily extend beyond the optimum time or possibly beyond the time when any procedure could be wisely instituted. If stenotic changes are present. a collapse procedure that would otherwise be of real benefit may not only be nullified, but the patient might actually be rendered worse.

Endoscopic methods can relieve and 'cure' this type of lesion in many cases. Silver nitrate in percentage ranging from 5 to 30 per cent is easily applied to ulcerating and granulomatous areas. However, not every patient will tolerate this chemical. In some patients the application is followed by increase in tissue cedema and inflammatory change. Fairly satisfactory results can be obtained by aspirating secretions, removing granulations with the gauze applicator, applying a 'soothing' application such as gomenol or monochlorphenol in mineral oil.

Only endoscopic examination will provide information about endotracheobronchial conditions and the author thinks that in time all patients with advanced tuberculosis will be bronchoscoped prior to the institution of collapse therapy.

(Judd, A. R., Pennsylvania State Sanatorium, Hamburg, Pa.: Journal of Thoracic Surgery, 16, 512-523, October 1947.)

Coronary Artery Disease in Diabetes Mellitus

STEARNS, SCHLESINGER AND RUDY reported on the 'incidence and clinical significance of coronary artery disease in diabetes melhtus'. They concluded that although advanced coronary artery disease is generally accepted as a frequent complication of diabetes, the high incidence of this complication of diabetes has hot been fully appreciated. They believe this to be due in small part to the fact that a statistical inclusion of young persons with diabetes in whom severe coronary artery disease, although not rare, is relatively infrequent. A second factor of statistical importance was the survival of diabetic persons to ages at which coronary artery disease becomes more frequent and more severe even in persons without diabetes. Such coronary artery disease was disclosed in approximately three-fourths of the hearts of fifty diabetic patients by means of post-mortem injection plus dissection technique. One-third of these patients died of coronary heart disease. One-fourth of the entire group had had angina pectoris.

Among diabetic women over the age of forty the incidence of significant coronary arteriosclerosis, of angina pectoris and of death due to coronary artery disease is as great as among diabetic men. This is disease is as great as among diabetic men.

in sharp distinction to the sex difference in these respects in the non-diabetic population.

Angina pectoris, deaths due to acute coronary disease and congestive heart failure, all are more common when hypertension is present in diabetic patients than when the blood pressure is normal. The severity of the coronary arteriosclerosis is correlated with the duration but not with the severity of the diabetes.

Early detection of the symptoms of coronary artery

disease in persons with diabetes is necessary if the sequelæ of coronary arteriosclerosis are to be postponed

or avoided.

Mild hyperglycæmia is preferable to a regimen which may result in insulin hypoglycæmia and the attendant

risk of precipitating myocardial infarction.
(Steams, Samuel, Tufts College Medical School, Boston, Massachusetts, Schlesinger, Monroe, J., and Rudy, Abraham: Archiv. Int. Med, 80, 463-474, October 1947.)

Erythema Nodosum

FAVOUR AND SOSMAN have reviewed the literature and discussed the clinical features of the disease erythema nodosum in 155 patients, 61 of whom were followed for one to 20 years. In reviewing the voluminous literature on the subject they show how strongly entrenched the belief is that erythema nodosum is a form of either tuberculosis or rheumatic fever. The form of either tuberculosis or rheumatic fever. The multiplicity of unrelated infections and drugs known to initiate crythema nodosum has tended to obscure its common association with infections caused by beta hemolytic streptococci. In this series, not only was there a high incidence of respiratory infections antedating cutaneous lesions but also beta hemolytic streptococci were cultured in material from half of the patients who were studied besterielesia. patients who were studied bacteriologically.

The low incidence of clinical tuberculosis is in contrast to the frequency of streptococcus infections associated with erythema nodosum. In commenting on the disease, Favour and Sosman agreed with Kerly (Brit. J. Radiol., 15, 155, 1942; ibid., 16, 199, 1943) that roentgen treatment does not cause reaction of the large lymph nodes or besten the course of the disease.

large lymph nodes or hasten the course of the disease. The evidence presented in this article indicates that erythema nodosum is not a form of rheumatic fever that may accompany it or follow it. In summary: (1) The clinical features of erythema nodosum in 155 patients, 61 of whom were followed for 1 to 20 years were presented.

(2) The disease occurred oftener in women (86 per cent), appeared in patients between the ages of 3 to 66 years, and usually developed during the winter months.

Tuberculosis was an uncommon antecedent (3) infection and rheumatic heart disease a rare sequelæ.

(4) Migratory polyarthritis was a part of the clinical picture of erythema nodosum in 80 per cent of adults and in a third of the children.

(5) Mild secondary anæmia, cervical adenopathy and occasionally enlarged hilar or bronchial nodes

characterized the illness.

(6) Erythema nodosum was thought to be a hypersensitivity disease with a variety of infectious and chemical agents and local trauma contributing to its

(Favour, Cutting B., Harvard Medical School, Boston, Massachusetts, and Sosman, Merrill, C.: Archiv. Int. Med., 80, 435-453, October 1947.)

Mycosis Fungoides

Winer made a study of mycosis fungoides particularly with relation to benign and malignant reticulum cell dysplasia. He stated that the variable histologic appearance of mycosis fungoides is based on the many potentialities of the differentiation of the reticulum cell.

Three cases were reported and comment made in each case followed by an abstract of discussion by Dr. Samuel E. Sweitzer, Minneapolis, Dr. C. Guy Lane, Boston, Dr. Hamilton Montgomery, Rockett, Boston, Dr. Hamilton Debroit and Dr. Fred Boston, Dr. Hamilton Montgomery, Rochester, Minnesota, Dr. Harther L. Keim, Detroit and Dr. Fred

W. Weidman, Philadelphia.

It was stated that in differential diagnosis, Hodgkin's disease must be considered. One of the differences noted was that Hodgkin's disease begins in lymph nodes and secondarily involves the skin, while mycosis fungoides involves the skin first and the lymph nodes secondarily. It was also noted that in differential diagnosis leukæmia cutis, multiple idiopathic hæmorrhagic sarcoma (Kaposi), melanoma, dermatofibrosarcoma, lymphosarcoma and metastatic carcinoma should also be considered. Dr. Winer concluded that mycosis fungoides is a disease in which tumours develop which are similar to those in leukæmic monocytic leukæmia. As in lymphatic or myelogenous leukæmia, the cutaneous tumours are manifestations of the underlying disease.

In mycosis fungoides the reticular cells may differentiate into diverse types on the one hand and undergo liquefaction necrosis or become malignant on the

other.

In one of the patients described with mycosis fungoides there was an associated hæmorrhagic sarcoma of Kaposi but these were two diseases entirely independent of each other.

(L. H. Winer, Beverly Hills, California: Archiv. Dermat. and Syphil., 56, 480-498, October 1947.)

Aerosol Treatment with Penicillin and Streptomycin

RECENTLY Barsch et al. in experiments on white rats found that penicillin is absorbed effectively by the inhalation route, and that autopsy and microscopic section of the lung tissue revealed very little difference between penicillin treated and control rats, indicating no irritant effect of the penicillin. Cultures have been made on souther immediately after penicillin acrosol made on sputum immediately after penicillin acrosol treatment and have revealed no pyogenic organisms in the majority of cases. Increased blood levels are reached by having the patient take a deep breath and hold it a few seconds after treatment. Ten to twenty per cent of the total amount of penicillin given in this manner is found excreted in the urine. Dr. Veach reports favourable results in several cases of chronic bronchitis, non-tuberculous, and bronchiectasis, using streptomycin combined with penicillin. In all cases of bronchiectasis the sputum was rapidly reduced, being only one-fourth to one-fifth as much at the end of the first week of treatment.

At the recent meeting of the American Medical Association in Atlantic City, Dr. Joseph D. Kelley stated that sinus surgery was being rapidly eliminated by the use of penicillin aerosol therapy. Since hamophilus pertussis is extremely sensitive to streptomycin, a number of investigators are administrating strepto-mycin by nebulization and are obtaining excellent results. Dosage for aerosol treatment consists of the administration of 25,000 to 50,000 units of penicillin and 1 gm. to 2 gm. of streptomycin either separately or combined, once to five times in twenty-four hours. Using oxygen to nebulize the solution, a flow of 6 to 8 litres of oxygen per minute is needed and using compressed air a pressure of 10 to 20 pounds is sufficient. An ampoule of aminophyllin can also be used in the nebulizer for the bronchospasm. Dr. Veach, in treating cases of acute sinusitis with considerable swelling of the nasal mucosa and blocking of the nostrils, uses 5 to 10 drops of tuamine or a similar decongestant preparation to facilitate the passage of the aerosol mist into the sinuses. Conclusions reached are:

1. The inhalation of penicillin and streptomycin

aerosol is of definite value in respiratory infections.

2. In certain respiratory infections it is more effec-

tive than intramuscular injections.

3. It is easy to administer, not unpleasant to the patient, non-toxic and gives us a useful addition to our armamentarium for the treatment of diseases of

the respiratory tract.
(Veach, Oscar L., Whitney Trust Building, Sheridan, Wyoming.: Rocky Mountain, M. J., 44, 816-817,

October 1947.)

Sarcoidosis: A Clinical and Roentgenologic Study of Twenty-eight Proved Cases

WHILE serving in an army general hospital which functioned as a centre for radiation therapy, McCort and his co-workers were afforded an opportunity to study a large number of mediastinal tumours. A clinical and histologic diagnosis of sarcoidosis was established in 28 cases.

Reviewing the history of sarcoidosis the authors say that since Besnier described lupus pernio in 1889 and Boeck ten years later studies the histologic structure in his cases of "multiple benign sarcoid of the skin", dermatologists have become increasingly aware of the cutaneous features of the disease. It was not until Schaumann in 1914 first realized that the cutaneous lesions described by Besnier and Boeck were in reality only a part of a generalized disease with characteristic pathologic changes in various internal organs that the present concept of the disease was possible. Jungling's description of the characteristic bony changes on roentzen study and Heerfordt's description of uveoparotid fever are notable contributions.

In remarks about the pathologic anatomy the authors say that little is known of the pathogenesis of the disease. Schaumann in 1924 discussed the relationship to tuberculosis and the different states of immunity present in the two diseases as indicated by the sensitivity of the skin to tuberculin. In 1936 he raised the question of a pleomorphic variant of the tubercle bacillus as the cause of sarcoid. This work has not been substantiated by other investigators.

Tubercle bacilli have been found by several workers in sarcoid lesions; however, the question always remains as to whether or not the patient had the two diseases

concomitantly.

Microscopically there is proliferation of the epithelioid cells, with the formation of granulomas. Giant cells of the Langhans type are present. In the lymph nodes the granulomas are arranged in clusters which may fill the entire node, but they usually do not break through the capsule. Lesions have been found to undergo fibrosis and replacement with hyalinized connective tissue and the presence of a large amount of collagen is taken to indicate a healing or healed process although King questioned the statement that the sarcoids are replaced by fibrous tissue. The centre of these tubercles may show slight necrosis, but true caseation is rare.

The manifestations of this disease are many and varied because of the number of organs and tissues varied because of the number of organs and tissues which may be involved. In general, four clinical types are recognized: (1) the sarcoids of the skin as described by Boeck and Besnier; (2) the uveoparotid fever of Heerfordt; (3) the type with lymphadenopathy of superficial or intrathoracic nodes simulating lymphoblastomas; and (4) a type in which there is primarily involvement of the pulmonary parenchyma on roentgen study and which, when there is also cough, loss of weight and slight fever, may closely resemble loss of weight and slight fever, may closely resemble pulmonary tuberculosis.

Summarizing their observations on the 28 patients who were sent to a military hospital that functioned as a centre for the treatment of tumours, they say that all their patients had intrathoracic lymphadeno-pathy, and all except two had enlargement of the superficial lymph nodes. The result of this selection will immediately be seen when it is noted that 27 of the 28 patients were men, while the sex incidence in most of the previously reported series was about

equal.

A detailed roentgen study of the 28 cases revealed the following features: (a) enlargement of the paratracheal lymph nodes in all; (b) enlargement of the peribronchial lymph nodes in 25; (c) pulmonary parenchymal involvement in 15; (d) pleural effusion in two instances; (c) pericardial effusion in one instance; and (f) osseous changes in the hands of six patients.

In 11 of the 28 cases the enlargement of the intrathoracic lymph nodes was more prominent on the right side, which may be explained on the basis of the anatomic finding that in the normal chest the lymph nodes are more numerous on this side. This fact is of no value in the differential diagnosis of benign and malignant lymphogranuloma, as was once suspected. In 27 of the 28 cases the enlarged intrathoracic lymph nodes tended to remain discrete and well defined. Calcification within the lymph nodes was seen in only one instance. In the course of the disease the enlarged lymph nodes may undergo spontaneous regression, to be replaced by fibrous tissue; this may be accompanied with increased evidence of parenchymal pulmonary involvement.

There was but one death in this series, which was due to failure of the right side of the heart secondary to extensive infiltration of the pulmonary involvement.

Radiation therapy was of no value in the treatment of the enlarged lymph nodes of sarcoidosis in the

two cases in which it was tried.

The authors were unable to confirm the incidence of leucopænia observed by other authors. Anæmia was found in only two cases. Eosinophilia was infrequent, and the monocytes were not consistently increased. No instance of a false positive reaction to a serologic test for syphilis was noted.

The finding of a frequently negative reaction to the tuberculin test and of a high globulin value was

(McCort, James J. Boston, Massachusetts, Wood, Richard Hugh, Hamilton, John B., and Ehrlich, David E.: Archiv. Int. Med., 80, 293-321, September 1947.)

Virus Diseases of the Nervous System

By T. M. RIVERS

(Abstracted from the Journal of the American Medical Association, Vol. 132, 26th October, 1946, p. 427)

THE clinical pictures of virus diseases of the nervous system do not depend on peculiarities of the viruses which cause them but on the location of the lesions produced. Since physicians are interested in the diagnosis, mode of transmission, prevention and treatment of disease, most of the writer's remarks will be confined to these matters. The following diseases are considered:

Rabies.—Rabies is one of the oldest virus diseases known and is indigenous to lower animals. Man is infected through the bites of rabid animals. The virus

is strictly neurotropic and is never found in the spinal fluid or blood of man. There is no laboratory test to aid in making a clinical diagnosis. Diagnosis after death is made by finding Negri bodies in the brain or by suitable animal passages. There is no specific treatment once the disease has been established. Vaccination as soon as possible after a bite from a rabid animal is mandatory. Rabies will not be eradicated soon, because its reservoir is in wild animals, such as foxes, coyotes, wolves, skunks, vampire bats and mongooses. Control of the disease lies in the licensing and vaccination of dogs.

Poliomyclitis.—The virus apparently attacks only nervous tissue, is not found in the spinal fluid, and only rarely has it been detected in the blood of human beings. The virus may be found in throat washings and is usually quite abundant in the fæces of infected persons. Paralytic poliomyclitis is not often diagnosed incorrectly during an epidemic. However, in the absence of an epidemic individual cases present diagnostic problems, as do non-paralytic and abortive cases both during and between epidemics. There is no rapid laboratory test to confirm a clinical diagnosis. Demonstration of virus in the fæces is helpful, but the patient is either dead or on the road to recovery before this can be accomplished. Neutralization tests on specimens of acute phase and convalescent serums are not particularly helpful, because there are several immunologic strains of poliomyclitis virus. There is no complement-fixation test available at the present time. At necropsy, the diagnosis is made or confirmed in the presence of distinctive pathologic lesions and the demonstration of poliomyelitis virus in the brain or spinal cord.

Recent findings of large amounts of virus in the fæces and the idea that the mouth and pharynx, instead of upper respiratory tract by droplet infection, constitute the most likely portal of entry in man more or less place this virus disease in the category of those with a mode of spread similar to that of typhoid fever and dysentery. Such action receives further support from the fact that poliomyelitis virus has been found in flies caught in nature. At the present time most workers believe that poliomyelitis is usually disseminated through contact, and that the fæces of infected people or carriers are the source of the infectious agent.

DDT sprayed from airplanes has been used to kill flies in the control of poliomyelitis. How much good this does is questionable, because no one is certain of the part flies play in the spread of the disease, and, furthermore, neither a lasting nor an economical control of flies is effected in this manner. Such a procedure for the control of flies, filth-inhabiting insects, might be considered analogous to the substitution of airplane sprays of soapy water for personal cleanliness.

The old problem of prevention and cure of poliomyelitis by means of convalescent serum is still debatable. If enough homologous antibodies were given to a child prior to or shortly after infection, evidences of the disease would be prevented. At present, however, pooled convalescent serum should be used with care because of the likelihood of transmitting serum jaundice. There is no good evidence that serotherapy of poliomyelitis after clinical, manifestations appear results in appreciable benefit.

St. Louis encephalitis.—The virus of St. Louis encephalitis was discovered in 1933 and can be obtained from the brain at necropsy but rarely, if ever, from spinal fluid or blood during life. Clinical diagnosis is confirmed by neutralization or complement-fixation tests. The virus has been experimentally transmitted by mosquitoes and chicken mites and has been found in mosquitoes caught in nature.

Western equine encephalitis.—Now it is known that it can produce serious epidemics in man; in 1941, approximately 3,000 cases and 200 deaths occurred in North Dakota, Minnesota, South Dakota, Manitoba, Montana and Nebraska. The virus rarely, if ever, is found in the blood or spinal fluid of human beings. Clinical diagnosis is confirmed by means of neutralization and complement-fixation tests. The disease has

been experimentally transmitted by mosquitoes, and mosquitoes caught in nature have been shown to carry the virus.

Eastern equine encephalitis.—Eastern equine encephalitis has occurred in human beings in Massachusetts and Texas. The virus is not easily obtained from spinal fluid or blood. Clinical diagnosis is confirmed by means of neutralization and complement-fixation tests. The disease has been experimentally transmitted by mosquitoes, but the virus has not yet been found in mosquitoes caught in nature.

Venezuelan equine encephalitis.—Venezuelan equine encephalitis occurs in horses of South America. There have not been many cases reported in human beings, and most of them have resulted from accidental laboratory infections. The virus is obtained easily from the blood and throat washings of human beings. Clinical diagnosis is confirmed by means of neutralization and complement-fixation tests. Little is known concerning the rôle that mosquitoes or other insects play in the transmission of the disease.

Japanese B encephalitis.—Japanese B encephalitis occurs in Japan and nearby areas and is considered identical with Russian autumn encephalitis. Most workers believe that Australian X disease and Japanese B encephalitis are similar, if not identical. Clinical diagnosis is confirmed by neutralization and complement-fixation tests. Several kinds of mosquitoes are capable of transmitting the virus experimentally, and Japanese workers have reported that the virus has been obtained from mosquitoes caught in nature.

Russian spring-summer encephalitis.—It has been reported that the virus can be obtained from the spinal fluid and blood of patients. Clinical diagnosis is confirmed by neutralization and complement-fixation tests. This is a tick-borne disease and usually attacks adults who go into forests in spring and summer to cut wood. Webster and Casals have shown that Russian spring-summer encephalitis is immunologically similar to, if not identical with, louping ill, a tick-borne disease of sheep in Scotland.

The diseases in the group just discussed, while being spoken of as encephalitides, are caused by viruses which are not strictly neurotropic. Indeed in some instances, for example, in Venezuelan equine encephalitis, the disease in human beings may resemble an attack of influenza.

There are two approaches to the problem of prevention of these encephalitides. One is through the control of insect vectors or the prevention of contact with them. The other is through the use of vaccines. Formaldehyde-treated vaccines have been prepared for the protection of human beings and horses against the eastern and western forms of equine encephalitis. A vaccine has been prepared against St. Louis encephalitis but has not been used on a large enough scale to warrant statements concerning its efficacy. The Russians have reported that they have an efficacious vaccine against their spring-summer encephalitis. They also have reported that they have a vaccine against Japanese B encephalitis; it consists of infected mousebrain material inactivated by solution of formaldehyde. The United States Army has prepared a similar vaccine which has not received sufficient trials to warrant statements concerning its effectiveness.

There is, as yet, no specific treatment for the encephalitides just discussed.

Louping ill.—Louping ill is a tick-borne disease that occurs in sheep in Scotland. Several cases have been described in laboratory workers. The virus is immunologically similar to, if not identical with, the Russian spring-summer tick-borne encephalitis of man. The virus is not readily found in the spinal fluid or blood of man, and clinical diagnoses are confirmed by means of complement-fixation and neutralization tests.

B virus encephalitis.—Three human beings are known to have been infected by B virus. The disease was acquired through the bites of monkeys, and all the patients died. The virus is pantotropic and produces typical acidophilic nuclear inclusions.

Lymphocytic choriomeningitis.—The virus of lymphocytic choriomeningitis attacks the central nervous system, particularly the meninges, as well as many other tissues in the body. Frequently, the disease caused by it resembles a mild attack of influenza. As a rule, cell counts in spinal fluid are higher than those in other virus diseases of the central nervous system with the exception of numps meningoencephalitis. The virus is obtained easily from spinal fluid and blood. A clinical diagnosis is confirmed by complement-fixation and neutralization tests. Wild mice caught in nature have been shown to be infected by the virus, and the epidemiology of the disease in some way is associated with this rodent host.

Mumps meningoencephalitis .- Before, during or after the appearance of a parotitis and sometimes in the absence of involvement of the parotids, mumps virus attacks the central nervous system, producing most frequently a picture of meningitis. Indeed, some workers are of the opinion that involvement of the central nervous system is the most important part of the mumps picture and occurs in practically every case. Others, however, do not believe in such a widespread occurrence. The writer sanctions the second opinion. Cell counts in spinal fluid are usually higher than those in other encephalitides with the exception of lymphocytic choriomeningitis. The virus has been found in the saliva, spinal fluid and blood of human beings. Clinical diagnoses are confirmed by neutralization and complement-fixation tests. From recorded pathologic observations it appears that two types of encephalitis have been observed in connection with numps; one in which there was evidence of direct action of a virus on the meninges, brain and cord; the other in which perivascular microglial proliferation and demyelination were prominent in a pathologic picture similar to that observed in the post-infectious encephalitides, the ætiology of which is not known.

Lymphogranuloma venereum.—Recently, it has been shown that the virus of lymphogranuloma venereum may attack the central nervous system; it has been

obtained from spinal fluid.

Herpes simplex encephalitis.—Herpes simplex virus causes fever blisters. Some years ago, Levaditi isolated the virus from a case of encephalitis and insisted that it is the cause of von Economo's disease. It is now known that this agent does not cause you Economo's encephalitis. On the other hand, it does occasionally attack the brain and cord of human beings, and recently it has been recovered from the brains of persons dying of encephalitis. The pathologic picture in man is similar to that of the encephalitis experimentally produced in lower animals; numerous typical acidophylic nuclear inclusions are found everywhere in the infected tissues.

Nervous diseases of unknown ætiology.-During and shortly after world war I, an encephalitis which now is generally known as von Economo's disease was recognized and described. At present, however, it is generally believed that the cause of the disease has not been discovered although most worker believed that been discovered, although most workers believe that a virus is responsible. The striking features of the disease are the dysfunction of the eye muscles resulting from lesions in the central nervous system and the distressing sequelæ, one of which is a Parkinsonian syndrome. This disease has been called lethargic encephalitis, sleeping sickness and epidemic encephalitis. None of these names are suitable, and they should be dropped because of the confusion which results from their use.

Guillain-Barré's disease presents many bizarre signs and symptoms which result from involvement of the central nervous system, the most striking being the large amount of protein in the spinal fluid with relatively few cells. Many workers believe that a virus causes the disease, but numerous attempts to isolate the agent have met with failure.

Benign or aseptic meningitides.-While for most of these meningitides no causative agent has been discovered, some cases so diagnosed would fall into groups of diseases of known ætiology, for example, abortive

poliomyelitis, lymphocytic choriomeningitis or one of the equine encephalitides, were proper laboratory tests

Diagnostic value of laboratory tests.—In all the diseases of the central nervous system of known etiology the virus has been obtained from the brain or cord with the exception of louping ill from which no deaths in man have been recorded. Exclusive of Russian spring-summer encephalitis, lymphocytic choriomeningitis, mumps meningoencephalitis, Venezuelan equine encephalitis, herpes simplex encephalitis and lymphogranuloma venereum, the viruses that attack the nervous system are so rarely found in the blood or spinal fluid that to seek them in these materials is not worth while for clinical purposes. In all of the diseases of known ectiology under discussion, with the exception of rabies, poliomyelitis, lymphogranuloma venereum and herpes simplex encephalitis, neutralization or complement-fixation tests are now available for the confirmation of clinical diagnosis. In order for the result of a neutralization or a complement-fixation test to be of value at least two specimens from each patient should be taken. A positive neutralization or complement-fixation test on only one specimen means that the patient at some time in the past has been infected with a particular virus. If antibodies against a virus are absent early in the course of a disease and appear during convalescence, it is reasonable to believe that this agent is the cause of the disease under consideration.

Medicolegal

A CASE OF CONGENITAL ABSENCE OF THE VAGINA

By J. H. HANNAN

(Abstracted from the Medical Press, Vol. 217, 2nd April, 1947, p. 270)

Cora S. was a fine sample of young womanhood when first seen in 1931. She was 24 years of age and so perfect were her face and figure that she carned a good living as a studio model and also had a secured position on the screen. She was brought by her mother because she was engaged to be married but had never menstruated.

On examination she was found to be a perfectly developed female with normal genitalia and normal sex characteristics. Vaginal examination was not possible, so a thorough examination of the pelvis was performed by the rectal route. At examina-tion, no uterus or ovaries was felt and the vagina appeared to be replaced by a mass of fibrous tissue. She was admitted into the private wing of the Hospital for Women, Soho Square, London, for a thorough examination under a general anæsthetic.

The hymen was normal, but no vagina could be found and there was no evidence of either uterus or ovaries on rectal examination. The mother was told that the prognosis was hopeless and marriage impossible. After being informed of this outlook, the patient became not only hysterical but suicidal. The parents pleaded to try any operative procedure, whatever the risk. In view of the deterioration in the patient's condition this

was agreed to.

A few weeks later, under a general anæsthetic, the hymen and the fibrous tissue band, which was replacing the vagina, were dissected off: now, as there was only the bladder in front and the rectum behind, with the peritoneum above, this turned out to be one of the most formidable operations. After some two-and-a-half hours' work the bladder, rectum and peritoneum were exposed. The labia minora were divided in such a way—that is, from above downwards—that they provided with two flaps roughly 21 inches long with an

attached pedicle. These were turned in and sutured with fine interrupted sutures to form a short vagina, about 2 inches long. This doubtful operation was terminated by inserting a lubricated glass stem, changed every day for a week, under a general anæsthetic. The patient was discharged in some three weeks.

The operator was invited to Cora's wedding! He

went with some misgiving, and found the patient well

and radiantly happy.

After two or three years the operator was interviewed by Cora's husband, who said he was going to divorce her because of her misconduct with a film director. The whole question raised a complicated issue as to whether a divorce in these circumstances was possible, and, in actual fact, if the whole marriage was in any way legal. At any rate, the husband could have obtained a decree on the grounds of nullity alone.

According to legal opinion the case raised new issues that, as yet, had never been tried in a court of law. Some months later the divorce had gone through.

Surely, apart from the rarity of this condition, this must be the only case on record where a surgical operation for congenital absence of the vagina, uterus and ovaries has such a degree of cure that a divorce could arise as a result of such a cure.

The operator heard from Cora S. some months ago, and she is living happily with her film director husband.

[In a subsequent personal communication to the Editor the author stated that the possibility of rectal coitus was excluded.—Editor, I.M.G.]

Reviews

RECENT ADVANCES IN MEDICINE.-By Beaumont, M.A., D.M. (Oxon.), F.R.C.P., D.P.H. (Lond.), and E. C. Dodds, M.V.O., D.Sc., Ph.D., M.D., F.R.C.P., F.R.I.C., F.R.S. Twelfth Edition. 1947. J. and A. Churchill Ltd., London. Pp. xll plus 422. Illustrated. Price, 21s.

This handy volume first published in 1928 has become an institution and supplies the practitioner and post-graduate student with up-to-date information on newer knowledge in medicine. Even research workers will find the lists of selected references on the topics of the day helpful.

Additions and deletions are well adjusted. The present edition although of the same size as its predecessor contains about 100 pages of new material. The latter includes thiouracil, primary atypical pneumonia, homologous serum jaundice, antibiotics, BAL, thiocyanates, folic acid and dicoumarol.

The old sections retained have been revised and

rewritten.

The get-up is good in spite of the restrictions on paper, etc.

An excellent publication.

S. D. S. G.

BLOOD PRESSURE AND ITS DISORDERS INCLUD-ING ANGINA PECTORIS.—By John Plesch. Second Edition. 1947. Baillière, Tindall and Cox, London. Pp. xiv plus 307 with 125 illustrations. Price, 21s.

In this book Dr. Plesch gives his views on blood pressure and its variations based on tonoscillograph. He advocates this method as apart from giving information on the maximum and minimum pressures it affords a valuable aid to the diagnosis of diseases of the heart and blood vessels. Arterial and venous pressure is considered in separate sections in which he gives the physical and physiological bases of their measurement with some clinical applications. The author's views are often original and sometimes stimulating. His conclusions are applied in the next section to angina pectoris 'the most common and most important affection of the arteries?. Here he discusses theories on its causation and describes its clinical aspects and therapy which includes an account of treatment with diet. In an appendix a description is given of tonoscillograph and other procedures.

R. N. C.

THE OCCASION FLEETING.—By Hugh Barber, 1947. H. K. Lewis and Company, Limited, London. Pp. viii plus 199. Price, 15s.

This is not a book on medicine but on being a medical man. In it the modern medical man in England will meet his opposite number of a previous generation. Guy's men will read the book with special interest.

Interesting and instructive essays by a medical man, mostly for medical men.

S. D. S. G.

RECENT ADVANCES IN SEX AND REPRODUCTIVE PHYSIOLOGY.—By J. M. Robson, M.D., D.Sc. (Leeds), F.R.S.E. Third Edition. 1947. J. and A. Churchill Limited, London. Pp. xii plus 336. with 65 illustrations. Price, 21s.

Another edition of this book which aims at the conquest of man himself, not merely of his environment, is welcome.

Items of particular interest are: pregnancy in various animals and its exploitation in determining ovulation, etc. A really safe period may be determined for women. (2) Effect of light on the pituitary glands and the chain of events in the gonads.

(3) Anti-hormones. It may be found possible to prevent pregnancy by a suitable anti-gonadotropic hormone, (4) Abnormal hormone production, (5) Male fertility and hyaluronidase. It may be possible to activate an otherwise inactive semen, by adding this ferment. (6) Carcinogenic effect of large doses and prolonged administration of cestrogens.

'The references are ample. The index could be fuller:

The anti-hormones, for instance, could be included.

S. D. S. G., 13

SYNOPSIS OF HYGIENE (JAMESON PARKINSON).—By G. S. Parkinson, C.B.E., D.S.O., M.R.C.S., L.R.C.P., D.P.H., Brig. R.A.M.C. (Retd.). Assisted by Kathleen M. Shaw, M.B.E. 1947. Ninth Edition. J. and A. Churchill Limited, London. Pp. viii plus 791 with 16 illustrations. Price, 28s.

This book has been kept up to date since its first appearance in 1920. The present edition supplies the latest information on recent legislation in England. It not only meets the requirements of the Public Health Diplomas and Degrees but also provides in admirable work of references for Public Health Departments.

The usual subjects have been dealt with a lucidity characteristic of the master of the subject. Five appendices supply details which would have marred the conciseness of and clogged the narrative. The index is

ample. A difference of opinion (p. 91): The downward trend of tuberculosis in England and Wales cannot be said to be the result of public health activity only. It began before dispensaries and sanatoria were ever thought of. Tuberculosis is a dying disease at least in Europe. Hence the lowest death rate.

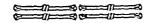
The paper, printing and binding are good. No printer's error attracts attention.

S. D. S. G.

BOVINE TUBERCULOSIS INCLUDING A CONTRAST WITH HUMAN TUBERCULOSIS .- By John Francis, B.Sc., M.R.C.V.S. 1947. Staples Press Limited, Cavendish Place, London, W.1. Pp. 220. Illus-Price, 258. trated.

This excellent book based on many personal observations of the author and about 400 selected references supplies the veterinary and medical reader with an

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unusually large amount of information within the covers

of a comparatively small book.

The difference in the pathogenesis of the bovine and human tuberculosis is lucidly described. Avian tuber-culosis is also included. Yet the author makes one wonder whether all forms of tuberculosis were not really one at least in 2000 B.C. when elephants died of tuberculosis in India.

Medical men will learn with a certain amount of

surprise that clinical diagnosis in cattle is difficult.

The important questions of milk and flesh of the tuberculous animal are discussed. While tuberculosis in cattle has almost disappeared from the U.S.A., in England it is 20 per cent, in Wales 7.5 per cent and in Scotland 14 per cent. Dairy-fed cows are worse than the pasture-fed ones. 0.5 per cent of all cows and 1 per cent of tuberculous cows in Great Britain have tuberculous udders. Indian cattle show evidence of natural resistance to the disease.

A readable book for almost everybody who treats

men or animals.

S. D. S. G.

COMMON SKIN DISEASES.—By A. C. Roxburgh, M.A., M.D., B.Ch. (Cantab.), F.R.C.P. (Lond.). Highth Edition. General Practice Series. 1947.

H. K. Lewis and Company, Limited, London.

Pp. xxxi plus 497. With 8 plates in colour and 212 illustrations in the text. Price, 21s.

This handy book will remain the backbone of the student and the practitioner. Its 11 pages of index of Preliminary Diagnosis for students will provide the answer to any enquiry, as far as common skin diseases are concerned.

The photographs in black and white and colour are excellent. This is due to the fact that Dr. Roxburgh

is an expert photographer.

Certain additions have been made to the list of common diseases. New remedies with the exception of streptomycin have been included. Section on varicose ulcer and eczema have been rewritten.

Amongst the old items the definition of Chancre redux remains unaltered. This name now denotes a recurrent chancre, a gumma occurring on the site of an old chancre

being Pseudochancre redux.

The get-up of the book has not been affected by the economy rules, only the gold on the letters on the binding is not fast.

An excellent publication.

S. D. S. G.

A TEXTBOOK ON PATHOLOGY OF LABOR, THE PUERPERIUM AND THE NEW BORN .- By C. O. McCormick, A.B., M.D., F.A.C.S. Second Edition. 1947. The C. V. Mosby Company, St. Louis. Pp. xxi plus 514, with 272 illustrations including 24 In colour

This is a textbook-but not in the general way that a textbook is written on obstetrics. It does not contain the description of what is conventionally called the description of what is conventionally called 'Normal'. It describes the abnormal in obstetrics. Here pathology means the abnormal. The book is written in what is called the 'Staccato' style—the author is lecturing to his class—the readers of the textbook. The views expressed are the author's—though they are the orthodox American in substance. Side by side with the experience of the author at the Coleman Hospital he has also quoted that of some prominent American hospitals. Quotations from De Leis famous book on obstetrics are plentiful.

From the above one would conclude that the book will be of great help to the practitioners for reference purposes and to students preparing for a degree

examination.

The book has been profusely illustrated, perhaps too much illustrated. The various pictures of feetal monstrosities and of such common instruments as cervical dilators could have been omitted. There is a three-page account of Samuelweis's work on puerperal infection. Important as it is, the function of textbooks is not writing biographies. There are some other

platitudes in the text which could either have been expunged or condensed.

The book does not cover any new field. It comprises chapters on obstetrics which are ordinarily described in the latter half of an average textbook of midwifery.

UTERINE CONTRACTILITY IN PREGNANCY: A STUDY OF THE CONTRACTIONS OF PREGNANCY AND LABOUR UNDER NORMAL AND EXPERIMENTAL CONDITIONS .- By D. P. Murphy, M.D., F.A.C.S. 1947. J. B. Lippincott Company, Philadelphia and London. Pp. vili plus 134. Illustrated. Price, 30s.

This book contains a description of the author's experiments and his conclusions from such experiments. The experiments were made on 1,200 pregnant women during both pregnancy and labour. In all about 3,200 records of uterine contractions were made. There is another interesting point in the study of these records. Records were made of the contractions of the uterus during pregnancy and labour, which went through both normal and abnormal courses. The effects of the more commonly employed drugs on the uterus during pregnancy or/and labour, c.g. posterior pituitary extract, were also studied. From the above it will be seen how valuable this book is likely to be, as a pioneer work on the research which reveals the possibilities of uterine contractions during labour. Apart from the academic question the conclusions arrived at will not be of much use to the practising obstetrician.

When, however, one discusses the conclusions arrived at after all these elaborate experiments one fails to discover anything which could not have been arrived at by an expert and carefully observant clinical obstetrician.

The book contains enough of material to satisfy the curiosity of an experimental physiologist doing research on the functions of the uterine musculature or on that of plain muscle in general. There are plenty of experimental and laboratory data to study. It is sure to be appreciated by academicians though the practical clinician may fail to benefit from it.

GYNÆCOLOGICAL AND OBSTETRICAL ANATOMY. —By C. F. V. Smout, M.D., M.R.C.S. With a Chapter on 'The Histology of the Female Reproductive Tract and its Endocrine Control'. By F. Jacoby, M.D., Ph.D. Second Edition. 1948. Edward Arnold and Company, London. Pp. xi plus 248. Illustrated. Price, 40s.

This book describes the gross and microscopic anatomy of the female genitalia external and internal. In relation to the genitalia, the parts of the urinary and alimentary apparatus have also been elaborately dealt with. Description of the bony pelvis is the subject-matter of the first two chapters. Then starting with the ovaries, all the organs of the reproductive system have been individually dealt with. Along with the minute and gross anatomy of the organs, their nerve and blood supply as also the lymph drainage have been fully illustrated in the text. The two concluding chapters are on the placenta and the fœtus. They have been a fitting conclusion to the subject-matter mainly dealt with. This book will be of great use to the advanced student for post-graduate qualifica-tions and also to teachers of obstetrics and gynæcology. The descriptions about the development of some of the organs have been rather sketchy. Even though the few illustrations are self-explanatory, a few more, e.g. those explaining the formation of the urogenital sinus and explaining the formation of the urogenital sinus and anomalies leading to 'Imperforate Anus', would have been appreciated. In the last chapter, description of common feetal monstrosities, e.g. an encephalus or spina bifida, should have been included.

There are very few books of this nature in English. This book is sure to be prized by those for whom it is meant. The printing of the text and of the pictures have been well executed.

have been well executed.



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2,731 cases comprising of 6,540 articles during the preceding year, an increase of 97 cases and 155 articles. The number of articles examined in each case varied

from 1 to 30.

Medicolegal section.—1,156 medicolegal cases and 4,204 articles were examined during the year under

report as against 1,132 cases and 4,170 articles in 1944.

Human poisoning.—The total number of cases examined under this head was 328. Poison was detected in 65.3 per cent of cases as against 67.8 per cent in 1944.

Opium was the most commonly used poison. It was detected in 39.2 per cent of the detected cases.

Animal poisoning.—20 cases were examined under the head as compared with 22 cases for the preceding year. The percentage of detection in these cases was 40 as compared with 59.1 for the year 1914.

Stain cases.—806 cases were examined under this section comprising 591 cases of blood stains and 215 cases of blood and semen stains (sodomy and rape

During the year under report 2,698 specimens of blood and other stains in 622 cases out of 806 were sent to the Imperial Serologist. 85 cases were sent to the Imperial Serologist for the comparison of the blood

groups as to identity or non-identity.

General section (including excise).—2,491 articles were examined as compared with 2,370 examined during the

year 1944.

The largest number of cases of illicit distillation was referred from Moradabad, 126, followed by Fyzabad, 80, Mirzapur, 62, Fatehpur, 57, Muzaffarnagar, 54, Shah-jahanpur, 29 and Bulandshahr 24.

The report gives five tables showing summary of work, result of medicolegal analyses, nature of poisons detected, places from which the viscera tested for poison have been received and general analysis for government departments.

A. B. R. C.

Correspondence

CARRYING STETHOSCOPES

Sir,-I beg to ventilate my feelings, which no doubt are shared by many of us, against the indecent practice of hanging one's stethoscope round the neck like a hangman's noose. This bad practice has become much in vogue during the last few years and it is a very common sight to find doctors riding a tram or a bus or going by a rickshaw or walking on the streets with their stethoscopes hanging round the neck. It may be argued to be a matter of convenience but is it not more honourable and dignified to carry it in one's pocket or hand-bag? The public in general no doubt pocket or hand-bag? The public in general no doubt is amused at seeing these doctors going about, looking, in their own estimation, important. It is an act of self-advertisement, like the red-cross signs and 'Doctor' displayed on the wind-screens of cars. These signs had their utility during the days of civil strife in the metropolis but why should they be continued?

CALCUTTA. 22-5-48,

Yours truly. R. N. CHATTERJEE, M.B.

[We agree. It is a vulgar display of one's profession. Further, it is futile. Medical men are not hired in the street like basket coolies.—Editor, I.M.G.]

PELLAGRA IN RURAL BENGAL

Sin,—I am glad to read the article entitled 'An outbreak of pellagra syndrome in a rural area of Bengal' in the November 1947 issue of your journal by Bengal' in the November 1947 issue of your journal by Dr. R. N. Chaudhuri. I also came to a similar conclusion, and my correspondence dated 12th February, 1947, was published in the April 1947 issue of the Journal of the Indian Medical Association (p. 256), in which I asked for an investigation by the public health authorities of the then united Bengal. The editor of

the journal also drew the attention of the authorities, and the then Assistant Director of Public Health, Dr. Khan, kindly visited the village for investigation.

Majority of the sufferers during the last two years approached me for treatment, and out of 56 cases 5 died of which 2 were women in advanced pregnancy who succumbed at child birth, 1 died of cholera and

the other 2 died of heart failure.

I visited the place twice and examined the food grains, water supply, general sanitation and availability of vitamins, but could not detect diseased rice grains in the affected households. What struck me most is the habit of eating overkept rice soaked in water, which is eaten as the first meal of the day in all seasons of the year. This gets rancid in the monsoon months when the symptoms first appear. The way that this boiled rice is kept is open to many objections. Neither is the pot properly covered. The houses are badly infested by musk rats, and the probability is that the rats infect this food article with some virus. As soon as this habit of taking overkept cooked rice was stopped and freshly cooked rice was substituted by the affected families, they began to improve. I have also noticed that recurrence happened in those families who returned to this habit. These villagers have the opportunity of getting all food articles fresh, and they do not use any preservatives and so I am inclined to think that this is a virus disease with pellagra syndrome.

The treatment that has been invariably successful is the administration of nicotinic acid with liver extract by injection, vitamin B, liver extract, iron and dilute

hydrochloric acid by mouth.

Such fresh food and fresh milk as are available to these villagers without extra expenses, as most of them cannot afford meat, eggs, etc., were advised to them. They never use milled rice, and rice is always made from paddy kept in their own granary as needed and not stored for long periods.

M. L. KUNDU, M.B. (Cal.), F.R.F.P.&s. (Glas.), L.M. (Dub.).

NABADWIP, 29th May, 1948.

[The response to treatment given is suggestive of a deficiency state, there appears to be little or no definite evidence of virus infection.—Entror, I.M.G.]

PALUDRINE: CHANGES IN THE DOSES

Sir,-Certain changes in the dosage of 'Paludrine' for the treatment of malaria have been announced in the medical press (see I.M.G., April 1948, page xxxv) and I would be glad of the hospitality of your correspondence columns in order that I may amplify this announcement for the information of the medical profession in India.

After the original clinical trials of 'Paludrine' by Professor N. Hamilton Fairley in Australia, by far the most extensive clinical trials were carried out in India and Pakistan under the auspices of the Malaria Insti-tute of India in the years, 1946-47. The results of these trials together with Professor Hamilton Fairley's published work led to the dosage recommendations contained in our present literature (leaster Pal/1/June 1947 and brochure Pal/2 dated July 1947). Concurrent with clinical trials in India, however, investigation were carried out in many other countries, and, in the reports from Africa particularly, it was apparent that certain strains of the falciparum parasite in Africa required a heavier dosage of 'Paludrine' than was recommended in our literature. A few workers in India also were of the same opinion and felt that in certain cases of severe infection with some Indian strains of both the P. falciparum and P. vivax parasites, a heavier dosage was advisable.

Amongst the trials set up in Africa were trials on the prophylactic aspect of 'Paludrine' for protection against malaria in endemic and hyperendemic areas. Some of the individuals treated in these trials developed malaria in spite of taking one tablet (0.1 gm.)

twice-weekly at spaced intervals. Apart from these occasional 'break-throughs', some doctors in Africa thought that a daily dose of one tablet (0.1 gm.) was easier for the individual to remember than a twice-weekly dosage at evenly spaced intervals. They thought that taking one 'Paludrine' tablet (0.1 gm.) daily would be easier, and would obviate the occasional 'break-throughs' that had occurred in their trials.

In deference to these views, we have therefore amended our recommendations for the treatment of malaria and these recommendations are as follows:-

(1) For Radical Cure, 0.3 gm. twice daily for 10 days. In the case of severe infections the dose may be increased up to 0.5 or 0.6 gm. twice daily for the first three days. (2) For a Clinical Cure, that is to say, control of the acute attack of malaria, a single daily dose of 0.3 gm. should be given until the fever subsides. This is the dose best suited for malaria arising in rural areas (which has been called by some Indian writers 'Village Malaria') where medical attention is not always easily obtainable. In the case of protection against malaria, however, although we have carefully considered the reports from Africa, we do not think that we are justified in recommending the medical profession in India to adopt the daily dosage of one tablet (0.1 gm.) for prophylactic purposes. There are many well controlled Indian trials published. and unpublished, which show conclusively that on a dose of one tablet (0.1 gm.) twice-weekly at evenly spaced intervals, or three tablets (0.3 gm.) once-weekly, the incidence of malaria can be reduced to almost negligible proportions, provided the administration of the drug is regularly maintained during the transmission season. We therefore do not propose to make any alteration in our recommendations for prophylaxis and protection against malaria.

Full details of the new recommendations have been given in our advertisement in your journal and I am writing this letter in the hope that these remarks will be of interest to the medical profession when considering the new dosage. The matter has not been decided by my Company alone, and the medical profession in India may rest assured that the dosage we are now advising in our literature and advertisements has the support of the highest authorities on malaria, both in

India and Pakistan and the U.K.

Yours, etc., J. M. MUNGAVIN, M.B., B.ch. (Cantab.), Medical Service Department, I. C. I. (India), Ltd., Calcutta 1.

Any. Questions

METALLIC DERMATITIS

SIR,—Here I have been attending to a few cases of vesicular dermatitis around open wound following injury by iron pieces in the form of splinters, aluminiumcoated iron hooks or plain iron bars without any

painting received during work.

The vesicles spread outwards apparently by lymphatic drainage every day within a course of 20 to 30 days making an area of 3 to 4 inches around the ulcer and usually last for 2 to 3 months. There is exudation of a thin, sero-purulent fluid and the vesicles dissolve leaving raw exudating surfaces without any scaling. They do not seem to respond to any local application like calamine lotion with sulphanilamide, zinc borne starch dusting, hydrarg. ammon., sulphanilamide or plain acriflavine or ½ per cent silver nitrate paint.

It appears to me like metallic dermatitis.

I shall be grateful if you can kindly suggest some remedy for this. I have not tried ichthyol yet.

Yours faithfully,

S. K. BANERJI, M.B.

[Smear from the ulcer should be taken and culture put up for Corynebact. diphtheriæ or any organism.

For treatment, penicillin spray (2,000 units per c.c.) every 3 hours during the day and penicillin ointment or borofax to apply at night are suggested.—L. M. G.1

TRANSMISSION OF WUCHERERIA BANCROFTI

Sir,-I shall be obliged if you could kindly enlighten me about the mode of transmission of Wuchereria bancrofti. I understood that it was through the bite of an infected mosquito (Culex) larva passing through the bite puncture though capable of penetrating the healthy skin.

I have just read in the 'Science and Practice of Surgery', 1948 ed. (vol. I, p. 258) by Romanis and Mitchiner, that the infection is through drinking water in which the bodies of mosquitoes (intermediate hosts) have fallen. Handfield Jones in 'Essentials of Modern Surgery', 1948, on p. 301, writes in a similar way.

Yours, etc.,

CAPTAIN B. P. MOHINDRA.

[The accepted idea of transmission of Wuchereria bancrofti and W. malayi is that the infective larva come out of the mosquito by piercing the Dutton's membrane during a blood meal and enter the final host (man) either through the puncture of the mosquitobite or more probably through a fresh puncture made by them. The other hypothesis that the infective larvæ which lie on water and are swallowed and thus cause the infection does not get support from majority of the authorities.—N. V. B.1

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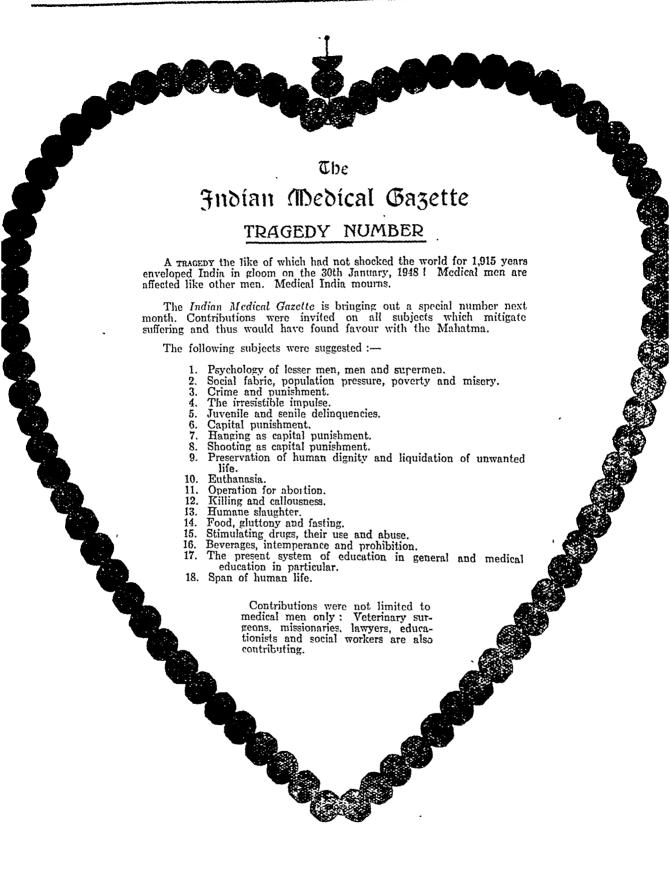
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Original Articles

CLINICAL MANIFESTATIONS OF ABDOMINAL TUBERCULOSIS*

(FROM SURGICAL ASPECT)

By A. K. DUTTA GUPTA, M.B. (Cal.), F.R.C.S. (Eng.) Second Honorary Additional Surgeon, Medical College Hospitals, Calcutta

This paper is based on the observations of 30 cases of abdominal tuberculosis admitted in the surgical wards of the Medical College Hospitals during the last 2 years, 1946 and 1947. Two cases from the Eden Hospital are included. Cases of genito-urinary tuberculosis including tubal tuberculosis and ano-rectal tuberculosis have not been included in this paper.

Diagnoses of these cases were made mainly on clinical observations, some of them being aided by radiology. The best means of confirmation, of course, is by operation when tubercles are visible or by histological examination of a piece of tissue removed at operation, e.g. from great omentum, etc., or at autopsy. I must mention that all cases were not operated upon, nor autopsy was possible on those who died without operation, for reasons well known to all.

Before going into the clinical manifestation it will be useful to mention in brief the pathological varieties of abdominal tuberculosis encountered, with a view to facilitating interpretation of signs and symptoms.

FIVE GROUPS

The pathological varieties are classified in five groups.

TABLE I Abdominal tuberculosis

Path	nological forms:		
I,	Intestinal tuberculosis—		_
	(1) Ulcerative type (2) Hypertrophic or hyperplastic type Tuberculous peritonitis—	. 1	
	(2) Hypertrophic or hyper-		} 15
	plastic type	14	j
II.	Tuberculous peritonitis-		
	(1) Ascitic type	7	} 10
	(2) Adhesive type	. 3	} ~~
III.	General miliary tuberculosis	3	
	(acute)	. 1	
IV.	Tabes mesenterica	. 2	
v.	Complications of intestina	!	
	tuberculosis (ulcerative)—		
	(1) Stricture of intestine	. 1	
	(2) Fæcal fistula	. 1	
	(3) Hæmorrhage	. 1	
			(found in 1
	•		of the cases
			mentioned
	(4) Destaurtion	n	above)
	(4) Perforation		

^{*}The paper was read at the Scientific Section of the 16th Session of the Medical College Re-Union, Calcutta.

I. INTESTINAL TUBERCULOSIS

(1) Ulcerative type.—This is by far the most frequent form of intestinal tuberculosis though not so frequent in a surgical ward. Its commonest sites are ileum, cæcum and colon, but no part of the intestine is immune. The lesion begins in the lymph follicles of the intestinal mucosa, and goes through all the stages of tuberculous process, e.g. tubercle formation, cascation, ulceration and fibrosis. This affection rarely occurs in the idiopathic form except during the first years of life. It is commonly the consequence of pulmonary tuberculosis, and in the majority of cases takes place after the latter has attained the suppurative or exudative stage. Consequently this variety is more often seen by physicians than by surgeons. In my series only one case of this type was met with.

(2) Hypertrophic or hyperplastic type.—This type of lesion is caused by tubercle bacilli of attenuated virulence. It forms an elongated lump, the size of which varies inversely with the virulence of the causative organism. This lesion usually develops in the excum and ascending colon; it is sometimes found in the other

parts of the colon as well.

The essential change seems to be a proliferation of connective tissue involving all the bowel layers and extending completely around the gut. The intestinal wall eventually becomes stiffened and thick. The lumen may be narrowed until it is almost occluded. This type is very frequently not associated with pulmonary disease. Ulceration is not a feature. This type because of the presence of an abdominal lump and absence of pulmonary tuberculosis is more often seen by a surgeon. There were 14 cases of this type in my series, constituting 46 per cent of the total cases. This is the commonest type in my series.

II. TUBERCULOUS PERITONITIS

(1) Ascitic type.—The abdomen becomes distended by fluid of a yellowish colour with low fibrin content but free fibrin is rarely seen in this type of exudate. Visceral and parietal peritoneum are studded with millet seed-sized tubercles. The omentum is usually only moderately thickened. Seven cases of this type are recorded in my series constituting 23 per cent.

This is the second commonest type.

(2) Adhesive type.—Peritoneal adhesions begin with the precipitation of fibrin. Contiguous loops of bowel are fixed by plastic exudate. Kinking, angulation or even actual obstruction may occur. In this form discrete tubercles are less likely to be seen than in the ascitic form being obscured by fibrinous exudate and adhesions. Three cases of my series belong to this type.

III. GENERAL MILIARY TUBERCULOSIS (ACUTE)

In this form, the bowel is reddened and studded with myriads of discrete tubercles.

Exudate may be turbid indicating greater virulence. One case is recorded.

IV. TUBERCULOUS MESENTERIC LYMPH GLANDS OR TABES MESENTERICA

Mesenteric lymph glands are enlarged; sometimes one group of glands is more enlarged than others forming a localized lump in the abdomen. Two cases are recorded.

V. Complications and Sequels of Ulcerative Intestinal Tuberculosis

- (1) Stricture of intestine.—From cicatrix of healed ulcers which are often annular in shape. Strictures are more commonly multiple and more frequently found in the small bowel. One case of the series comes under this category.
- (2) Facal fistula.—It occurs more frequently in connection with the large bowel than the small bowel (3:1). One case of this variety has been found in my series, and three round-worms were noted to have emerged through the fistula.
- (3) Hamorrhage.—Severe or fatal hamorrhage is rare, because as the ulcer progresses there is thickening of its base with endarteritis obliterans of the vessels in the neighbourhood. Macroscopic blood in the stools of patients with advanced intestinal tuberculosis is by no means common, but occult blood occurs even in many early cases where macroscopic blood is wanting. One of the cases in this series passed a fair amount of blood with clots in loose stool.

TABLE II
Analysis of 30 cases

Agc:					Number cases	of
Up to	o 10 years		• •		1	
10 to	20 years				8	
	30 years				12	
	40 years					
40 to	50 years		• •		8 1	
Sex:						
Male	\$				14	
Fema	.lea .				16	
patients	· :	oms as	mentioned	by		
Histo	ny of days				6	
✓ Histo	ry of week	s			ĭ	
Histo	ry of mont	hs:		• •	-	
	to 2 mont				6	
	to 4 mont					
4	to 6 mont	hs	• •		$egin{array}{c} 3 \ 1 \ 4 \end{array}$	
g	to 8 mont	hs			4	
8 -11-1	to 10 mon	iths	• •		3	
✓ nisto	ry of years	:				
1	to 2 years		••		2	
. 2	to 4 years		• •		4	

(4) Perforation.—Intestinal perforations are very uncommon considering the number of tuberculous ulcers. This is due to (i) thickening of the bases on deepening of the ulcer by inflammatory processes, (ii) occurrence of localized adhesive peritonitis, matting together loops of intestine and omentum, and (iii)

supervening of death from pulmonary tuberculosis before the ulceration extends through the wall. No case of perforation has been recorded in this series.

INCIDENCE

Age.—Abdominal tuberculosis is a disease of the young and of those in early middle life, the highest number, i.e. 12 of my series occurring between 20 and 30 years. Only one case was found below 10 years of age and one above 40 years.

Sex.—Practically equal incidence in both sexes.

DURATION OF SYMPTOMS AS MENTIONED BY THE PATIENT

In the large majority of cases the history is of months rather than of weeks or years. In some cases, 6 in number, the history is of days. All of them came with acute symptoms and I think that patients' attention was drawn by the acute exacerbation (50 per cent of these cases died). Under more detailed grouping regarding duration, it is found that the highest number of cases come with a history of 1 to 2 months.

COMPLAINTS

These are mentioned in order of frequency as complained of by the patients in my series.

(1) Pain.—This is the most frequent and most important of all symptoms. It was present in all the cases. The site of pain of course varies, the commonest site being the right iliac region, and the next in order being diffuse or generalized pain in the abdomen. Pain in the epigastrium or umbilicus is also found.

Character of the pain is also variable, the commonest type met with being colicky or cramping, and the next common being dull aching pain. Other types of pain are sometimes found. It is evident from above that the commonest variety is colicky pain in the right iliac region and the next common is generalized dull aching pain. Reasons are not difficult to understand, as the commonest lesion is hyperplastic tuberculosis in the cæcal region with tendency to narrowing of the lumen and the next in order is tuberculous peritonitis of the ascitic type which is more often generalized.

- (2) Vomiting.—It has been noted in 16 cases. In some it occurred after meals whereas in others it had no relation to food. In one case there was coffee-grounds vomit. In that case the pyloric region of the stomach was invaded by a tuberculous mass from the transverse colon and the greater omentum. Rarely peptic ulcer may occur in stomach or duodenum as a complication of tuberculous entero-colitis, which may cause coffee-grounds vomit.
- (3) Fever.—It has been observed in 16 cases, and in most of them it is present or marked in the evening.

- (4) Constipation.—It has been found in 10 cases and can be accounted for by the fact that the common lesion is the hypertrophic type with tendency to narrowing of the lumen of the gut.
- (5) Diarrhæa.—It has been observed in 7 cases.

It commonly occurs with intestinal ulcers but does also occur without ulcers. In my series diarrhæa was never severe and had no special time of appearance. It is believed that diarrhæa is common after meals or at night in intestinal tuberculosis. Diarrhæa is due to increased peristalsis or interference with absorption of water from intestinal contents.

(6) Appreciable emaciation and loss of weight.—Found in 8 cases.

TABLE III

Symptoms as described by patients

/ .	Sympromic at		-		
	in:—				
`	Site: Epigastrium Right iliac reg Generalized or Starts at umb spreading all Upper abdome Lower abdome	diffuse ilicus and t lover en	1	3 1 7 5 2 2	30
, Ar) Character:				
	Colicky or cra Dull aching Stabbing (sha Diffuse vague Burning Dragging No description	.rp) 	1	10 8 4 1 0 0 7	30
2. V	omiting :-				
A	fter food or no	relation to	food	16 1)	
	(Coffee-grounds	vomit	• •	16	
	rever	• •	• •	10	
	Constipation	••	••	10	
$\sqrt{5}$. I	Diarrhœa:			2	
	Mild Moderate	••	• •	5	
	Severe		• •	0	
J,	Time of occurren	ce:		۸	
,	Night		• •	0	
	After meals	ima		7	
./	No special ti			5	
6.	Loss of appetite	ornetation		5	
. 47.	Acidity or acid of Menstrual disturb	hance :			
√8.	Menorrhagia			1	
	Amenorrhœa	••	• • •	4	
V 9.	Emaciation and	loss of weig	ght	8 4	
√ 10.	Cough	• •	consti-	-	
√ 11.	Alternate diarrh	ica and		3	
✓ 12.	Nausea	• •	• •	1 1	
	Flatulence Discomfort after	· moole		i	
√ 14.	Bleeding per rec	tum	• • •	1	
₹16.	Nervousness or	irritability		1	
1.17.	TTdoobo			2	
18.	Loss of energy	and weakn	ess	1 2 2 1	
/19. /20.	Hæmoptysis Pain in chest			1	
$\frac{20.}{121.}$	Y	(1 12- To	tor to	1	
22.	Persistent sinus fæcal fistula)	(leading in	ter to	1	

- (7) Loss of appetite.—Not uncommon, found
- (8) Acidity or acid eructation.—Also found in 5 cases.
- (9) Menstrual disturbance.—Amenorrhæa is common.
 - (10) Cough (periodic).—Also noted in 4 cases.
- (11) Alternate diarrhæa and constipation.— Found in 3 cases.
- (12) Flatulence, (13) nausea, (14) discomfort after meals, (15) loss of energy and weakness, (16) hæmoptysis, (17) hcadache, (18) hæmorrhage per rectum, (19) nervousness, (20) pain in chest, (21) fæcal fistula, in one case, (22) dysphagia due to simultaneous enlargement of mediastinal lymph glands causing pressure on the æsophagus complete the list.

HISTORY

In my series, there has been history of fever, hæmoptysis, abdominal pain, dysentery and caries spine with cold abscesses (the only form of extra-pulmonary tuberculosis found).

SPECIAL SIGNS

all signs. It may be either localized or generalized. Localized tenderness in the right iliac region was noticed in 12 cases, and generalized tenderness in 9 cases. This is in conformity with our expectation as the commonest forms of disease are hyperplastic type in right iliac region or generalized tuberculous peritonitis. Occasionally, tenderness may be in other areas of the abdomen, which is due to either localized peritonitis or involvement of other parts of the bowel, e.g. hepatic flexure or transverse colon, or distension of small intestine.

(2) Lump or mass.—This is a very valuable and positive sign. It is most often found in the right iliac region as is expected from the greater frequency of the hypertrophic type. It is an elongated lump, movable except in advanced stage. Lumps are also felt in the epigastrium or near the umbilicus due to involvement of greater omentum, transverse colon or retroperitoneal or mesenteric lymph glands. These lumps are solid, feel firm or hard and do not alter in size during the course of examination. Sometimes there are localized swellings which are soft in feel and alter in size or even disappear or change their position during the course of examination. These are due to partial obstruction of coils of small intestine or stomach. Lumps in right iliac region were found

(3) Distension.—It is fairly common and is due either to collection of fluid in the peritoneal cavity as in peritonitis of ascitic type or to gaseous distension of small intestine or stomach from obstruction by adhesive type or hyper-

trophic type.

(4) Free fluid in the peritoneal cavity.—It was found in seven cases, i.e. all the cases of

ascitic type of peritonitis. It is an important

sign in tuberculous peritonitis.

(5) Doughy feel of the abdomen.—It is a very valuable sign in abdominal tuberculosis, and is found in early and less advanced cases. It is caused by thickening of the greater omentum and matting between the coils of intestine. It was found in three cases of my series.

peristalsis.—Sometimes (6) Visible It indicates although not very frequent. obstructive phenomenon of the gastro-intestinal tract from kink or adhesion in adhesive peritonitis or stenosis in intestinal tuberculosis. In my series there were three cases of visible peristalsis of the stomach, as noted by visible peristalsis in the epigastrium moving from left to right, and in two of these obstruction was caused by a hypertrophic mass in transverse colon and greater omentum invading the pyloric region of the stomach. All these cases manifested typical features of pyloric stenosis. Only one case showed visible peristalsis of small intestine.

(7) Rigidity.—It is sometimes found but is not common. In one case only it was found in the right iliac region and in four cases it was either generalized or in lower or upper abdomen. When found, it is of the mild or moderate degree

and never very marked.

(8) Palpable glands in the abdomen.—They found either primarily as in tabes mesenterica or in association with other forms of abdominal tuberculosis. As elsewhere they tend to be multiple and matted when big.

(9) Absent peristaltic sounds (on auscultation).—It is an uncommon feature in disease, but was noted in two cases.

(10) Liver and spleen.—They were palpable in some cases, due probably to other causes.

(11) Rectal examination.—A mass felt in pelvis in one case which was continuous with that in right iliac fossa.

(12) Vaginal examination.—A mass felt in pelvis in two cases and in one of them a diagnosis of hydrosalpinx was made (subsequently dis-

proved on the operation table).

(13) Lungs - Evidence of pulmonary tuberculosis was detected clinically in one case only, and x-ray showed infiltration in three cases, thus showing the primary nature of the abdominal

conditions as found in surgical wards.

(14) Facal fistula.—It was found in one case and its tuberculous nature was proved by opening the abdomen when the ascending colon was found thickened and the terminal ileum showed some tubercles. The fistula was connected with ascending colon.

GENERAL SIGNS

 Temperature.—A rise of temperature was detected in the majority of cases, and in most of them it did not exceed 100°F.

(2) Pulse.—Often more than normal rate,

majority between 80 and 120.

(3) Anæmia.—Commonly found.

(4) Blood pressure.—Often low.

(5) Nourishment.—Poor.

(6) Jaundice.—Rare; detected in two cases.

TABLE · IV Signs

յ1.	Tenderness:-				
	(a) Localized:				
	Right iliac regi	on .	••	12)	or.
	Other areas of	abdomen	••	$\frac{4}{9}$	25
	(b) Generalized	• •	••	9)	
√2.	Lump or mass:				
•	Right iliac region	1,	••	12	
	Other areas of al	odomen:		٠, }	18
	Stationary in s Alteration in si	ize	• •	$\begin{vmatrix} 3 \\ 3 \end{vmatrix}$	
√3.		ze	••	3	
4.	Doughy feel Distension	• •	••	11	
~		••	••	**	
×5.	Rigidity:	•		•	
	Right iliac reg	ion Iower er un	nor	1	
	abdomen	lower or ap	ber	4	
. 16	Visible peristalsis:	••	••	-	
∨ 0.				9	
	In stomach Elsewhere (inte	ctinal	••	$\frac{3}{1}$	
/7	Free fluid in per	itonest cox	ritv	-	
√ "·	(positive shifting	dullness)		7	
	(Fluid thrill)	••		2 2	
8.	Absent peristaltic	sounds		2	
V9.	Palpable glands in	abdomen:			
	Right iliac regi			1	
	Other areas of	abdomen		4	
10.	Liver palpable			4	
	Spleen palpable	••	• •	2	
√ 12.	Lungs:				
	Clinical infiltra	tion		1	
40	Bronchitis	• •	• •	7	
/13. /14.	P. R. mass felt	••	• •	1 '	
15.	P. V. mass felt Anæmia (moderate	and mark	٠ <u>ن</u>	2 12	
16~	Temperature:	and mark	eu)	12	
X 10:-					
	During admission				
	Above normal	to 100°F'.	••	11	
_	Above 100 to Above 102°F.	102°F.	٠.	5 2	
17.	Pulse:	• •	• •	4	
V 11.					
1	During admission	.—			
ł	74 to 80 80 to 100	• •	• •	3 7	
ł	100 to 120	••	• •	7 7	
	120 upwards	••	••	5	
18.	Tongue, dry and	coated	• •	6	
19.	Nourishment poor	•••	• •	20	
20.	B. P. low		. ,		
×21.	Jaundice	• •	••	2	
£ 22.	Fæcal fistula	••	• •	1	

CONCLUSION

Patients from young to middle adult life with history of a few months, either having a tender elongated lump in the right iliac region with evening rise of temperature and occasional vomiting and tendency to constipation, or appearing with gradually increasing distension of abdomen with fluid and a doughy feel of the abdomen, should be looked upon as having abdominal tuberculosis. Some cases come as acute abdomen, whose true nature is discovered only after a laparotomy.

HIPPURIC ACID SYNTHESIS TEST AS AN AID TO PROGNOSIS IN CON-GESTIVE HEART FAILURE

By K. S. MATHUR, M.D., M.R.C.P. (Physician, Thomason Hospital, Physician In-charge, Heart Clinic, and Lecturer in Cardiology, Medical College, Agra)

To assess the gravity of the immediate outlook and to estimate an average duration of life after the onset of congestive heart failure are full of difficulties on account of the great variations that exist. Burch and Winsor (1945) have emphasized that electrocardiogram does not indicate the prognosis. Harrison (1939) reports on cardiac output and studies of circulation time in congestive failure by Tarr, Oppenheimer and Sager (1933) have shown that tests of circulatory functions are tedious and unhelpful in prognosis. The clinical criteria are many but they involve a great deal of personal factor. Boyer, Leach and White (1941) lay particular stress on marked cardiac enlargement, old age and presence of more serious uncontrollable precipitating factors and complications as the most unfavourable findings. In fact one has to agree with Lewis (1936) that the only sound basis of prognosis is actual experience of a case.

Under such circumstances, it was considered necessary to find a workable test for judging the prognosis and result of treatment in congestive heart failure cases, and this has been the main purpose behind these investigations.

The liver, situated at the gateway to the heart with its hepatic veins practically opening into the right auricle, being involved early in congestive heart failure has been made the focus of study. Jolliffe (1930) used brom-sulphalein test of liver function in 16 patients with right heart failure. There was evidence of impaired function in the form of retention between 5 and 20 per cent of the dye in 12 cases. Cantarow (1935) found retention exceeding 5 per cent in 14 of his 42 patients with heart failure of varying severity: in 2 there was cent per cent retention. Jolliffe obtained positive lævulose tolerance test in 3 of the 16 patients just mentioned. 42 cases of Cantarow's showed normal cholesterol content of the blood. Fishberg observed a normal percentage of cholesterol esters in several Fishberg (1923)of severe failure. reported increase in the bilirubin content of the blood in 21 out of 23 severe and protracted cases of heart failure in the Montefiore Hospital for chronic diseases amongst patients who had been ill for over a year. On the other hand hyperbilirubinæmia was found in only 2 out of 7 patients with severe heart failure of recent In several patients with isolated inception. heart failure and intense engorgement of the lungs, the bilirubin content of the blood was not notably increased.

The only suggestive findings with regard to prognosis are recorded by Carter and Maelagen

(1946) who performed flocculation tests (both serum colloidal gold test and thymol turbidity test) on 28 cases of congestive heart failure and found death occurring in all the 8 markedly positive cases within four months, compared with 4 deaths out of 17 negative cases in the same period. All with positive flocculation reactions had urobilinuria, while it was present in 5 of those with negative reactions. They thought that presence of urobilinuria appeared to be a more sensitive test of liver function in heart failure. Wahi (1946), on the basis of 3 cases only, suggested that 'the cardiologist may find hippuric acid synthesis test of great value in gauging the prognosis in congestive heart failure cases'.

Method of investigation

Thirty-six cases of congestive heart failure in various grades of decompensation were studied. These include 29 Hindus and 7 Mohammedans, 26 males and 10 females. The ages of the patients varied from 11 years to 70 years, the average age being 39 years.

Table I
Summary of 36 cases on atiological basis

umber of cases
8 7 1 2 2 1 1 10 3

Detailed history was taken and a thorough clinical examination done in every case. Radiological and electrocardiographic examinations were undertaken in all but the very severely ill cases who could not be moved. Blood, stool, sputum, Wassermann, urine, and van Slyke's urea clearance tests were done as a routine. The liver biopsy was done on 12 cases of this series, the results of which have already been reported by Wahi and Mathur (1947).

Five criteria were selected for judging the extent of congestive heart failure: (1) general appearance (apparently well +, slightly ill ++, moderately ill ++++, very ill +++++), (2) dyspnæa (on moderate exertion +, on walking ++, at rest ++++, orthopnæa ++++), (3) veins in neck at 45° in bed (just seen +, up to middle of neck ++, up to angle of jaw ++++, full +++++), (4) ædema (feet or face +, feet and legs +++, feet, legs and abdomen ++++, generalized or with ascites +++++), (5) liver enlargement below costal margin (up

to 1" +, up to 2" ++, up to 3" +++, more than 3" ++++).

The degree of failure was judged clinically by adding plus of all the five columns and dividing by five. Thus, first degree of failure would be represented by +, second degree failure by ++, third degree failure by +++ and fourth degree failure by ++++. These were charted on admission, during the course of treatment and at the time of discharge.

For estimating the liver efficiency the intravenous modification of Quick's hippuric acid test was carried out on admission, during treatment and before discharge and compared to the clinical tests charted separately on the same day.

Intravenous hippuric acid test was employed, as it has been found simple, reliable, safe and cheap test involving a normal physiological process. This test has been found very sensitive when compared to a number of liver function tests done on the same set of patients by Quick (1936), Snell (1935), Snell and Magath (1938), Probstein and Londe (1940) and Mateer et al. (1943). The details of the method employed are given below:—

The patient was allowed milk or dalia in the morning. He was asked to empty the bladder completely at 10 a.m. An intravenous injection of 20 c.c., 8.85 per cent solution of sodium benzoate was given very slowly. A pint of water was given to drink to ensure a fair amount of urine. Exactly after an hour, bladder was emptied again. The urine was taken to laboratory for analysis.

The urine volume was measured to the nearest c.c. A few drops of Congo red were added to the urine. One c.c. or more of concentrated hydrochloric acid was gradually added until the urine was acid to Congo red (the colour changed to dark brown or black). The urine was stirred all the time until the precipitation of hippuric acid was complete. It was allowed to stand at room temperature for an hour. A weighed filter paper was put in a small Buchner funnel and the urine filtered three times to ensure the whole precipitate remaining on it. This was left in the incubator for 24 hours, after which it was weighed. The weight of the precipitate was determined.

The weight of the precipitate was determined.

The weight of hippuric acid passed in the sample of urine is now known. The amount of hippuric acid that remained dissolved in solution was calculated from the known solubility of hippuric acid in urine (0.33 g. per 100 c.c. urine) and the volume of urine. These figures multiplied by 0.68 will give the result in terms of benzoic acid thus:—

Benzoic acid excretion = 0.68 (weight

Volume urine × 0.33

Coincident van Slyke's urea clearance test was done in every case to exclude the possible renal dysfunction vitiating the interpretation of liver function test.

In view of the figures of hippuric acid excretion arrived at by Heilig and Visveswar (1944) and Wahi (1946) in Indians far below those quoted by Quick (1939) and Sherlock (1946), it was considered necessary to carry out the test first on healthy persons to form the necessary standard. The results have been given in table II.

The results confirmed the low limits of normal function in Indians with a range of 0.56 g. to 1.16 g. and a mean of 0.72 g. It is certain

TABLE II

Hippuric acid excretion tests in normal subjects

Case	Age, religion,	Volume of urine, c.c.	Hippuric acid calculated as benzoic acid (g.)
K. M. H. F. H. A. B. S. P. W. M. G. K. N. B. K. S. T.	34, H., M. 25, M., M. 25, H., M. 28, H., M. 27, H., M. 27, H., M. 36, H., M. 36, H., M. 34, H., M.	62 74 108 98 56 66 50 57 84 43	0.56 0.58 1.16 0.79 0.68 0.83 0.60 0.77 0.58 0.65

that new and lower normal standards will have to be adopted for clinical work in India.

Results

The results of hippuric acid excretion of all the 36 cases have been carefully analysed on the basis of actiology of cardiac failure, number of previous attacks of failure and the size of liver enlargement but no significant correlation could be established. With a hippuric acid value of 0.54 g. the liver was enlarged 6 inches in case 23, 3 inches in case 6, 2 inches in cases 12 and 30 and no enlargement in case 22.

Most significant observations were made in 34 cases of right ventricular failure. These included 31 cases of primary right ventricular failure and 3 cases (cases 20, 22 and 28) of primary left ventricular failure with ultimate right-sided failure.

The results of hippuric acid test compared to the clinical degree of failure have been tabulated (table III). It will be observed that cases with first degree of cardiac failure show almost normal figures of hippuric acid excretion whereas it is markedly diminished in cases of fourth degree of failure.

Table III

Relation of degree of cardiac failure to hippuric acid excretion

Degree of cardiac	Case numbers	Hipi		Mean
failure		Mini- mum	Maxi- mum	mean
+ ++ +++ ++++	3. 11, 22, 29 4, 6, 8, 12, 15, 18, 26, 35 2, 16, 30, 32, 34 1, 5, 7, 9, 10, 14, 17, 19, 20, 23, 25, 27, 30, 33, 36.	0.60 0.41 0.32 0.16	0.69 0.60 0.55 0.54	0.65 0.52 0.48 0.32

The hippuric acid excretion therefore gives a good idea of the degree and extent of congestive heart failure.

The values of hippuric acid excretion on admission of all the 32 cases referred to above have been subjected to a critical analysis to find if they give any indication as to immediate prognosis and risk to life.

Table IV
Relation of hippuric acid to immediate prognosis

Hippuric acid on admission (g.)	Number of cases studied	Number of deaths in hospital	Deaths in percentage
0.10 to 0.20 0.20 to 0.30 0.30 to 0.40 0.40 to 0.50 0.50 to 0.60 0.60 to 0.70	4 4 5 7 9 3	4 1 1 0 1	100 25 20 0 11

It will be observed that all the four cases (cases 7, 9, 19 and 27) with hippuric acid excretion below 0.20 g. died in the hospital, whereas one case (case 33) with 0.27 g. from amongst four cases of that group and one case (case 17) with 0.33 g. died out of five cases of the third group. All cases with hippuric acid excretion above 0.40 g. survived under the same conditions of hospitalization, nursing and treatment except one case (case 6) who died an unexpected sudden death.

The functional derangement of the liver being dependent on passive venous congestion and resultant anoxemia, it was considered necessary to follow the results of hippuric acid tests in relation to the clinical improvement of the cases. There was regular steady improvement throughout the hospital stay in the twenty cases given in table V and invariably the hippuric acid, results have shown a marked steady rise.

Most interesting observations were made in cases 8 and 25, whose conditions showed clinical deterioration at some stage or the other during their hospital stay and these were reflected in the hippuric acid excretion results.

Table V
Relation of hippuric acid to clinical improvement

Case	Hippuric acid (g.)				
number	On admission	During treatment	On dis- charge		
1 2 4 10 12 14 16 18 20 21 22 23 26 28 29 30 32 34 35 36	0.40 0.52 0.49 0.45 0.60 0.48 0.51 0.20 0.30 0.60 0.54 0.44 0.42 0.64 0.55 0.52 0.32 0.48 0.28	0.62 0.64 0.60 0.50 0.96 0.69 0.52 0.42 0.63 0.70 0.72 0.84 0.48 0.76 0.60 0.68 0.38 0.60	0.84 0.81 0.68 0.64 1.12 0.68 0.78 0.72 0.56 1.18 0.72 0.96 1.02 0.50 0.82 0.65 0.74 0.78 0.78 0.79 0.80 0.79 0.80 0.79 0.80		

Case 5 is a little different from the two cases described above. The patient was 'very ill' on admission with hippuric acid 0.40 g. Within 5 days hippuric acid excretion fell to 0.32 g. without any appreciable change to the worse clinically. Fall in hippuric acid might have been the first indication of the deterioration in his condition and a timely pointer to supplement his treatment. Ascites was relieved and neptal injections were given followed by definite improvement clinically.

Case 31 showed no change in the hippuric acid excretion even after four weeks' stay in the hospital. The low figure 0.26 g. was due to wellestablished cardiac cirrhosis of liver and under such conditions any improvement over that figure was unlikely in view of the physiology of hippuric acid synthesis.

Two cases, 3 and 11, gave normal figures of hippuric acid excretion, viz 0.69 g. These cases were admitted in that early stage of heart failure

Table VI
Relation of hippuric acid to clinical condition

Case number	Date	Dyspnœa	Neck veins	Œdema	Liver	Pulse	Respiration	Hippuric acid (g.)
25	17-5-46 20-5-46 28-5-46 1-6-46 12-8-46 20-8-46 30-8-46 15-9-46 30-9-46 9-10-46	+++ ++++ +++ +++ +++ +++ +	++ +++ + - +++ ++ ++ +	- + - - ++++ +++ - ++	 +++ +++ + +	96 95 86 80 112 103 90 90 90 86	30 34 26 24 36 36 24 26 24 24	0.58 0.35 0.62 0.66 0.39 0.68 1.00 0.71 0.96 1.09

which Lewis used to call 'the stage of symptoms or waning reserve.' At that early stage there is no passive congestion or anoxamia of liver, hence no derangement of liver function and consequent normal hippuric acid result.

Hippuric acid test was found to be of no value, prognostic or follow up, in the two cases of left ventricular failure following coronary thrombosis. The hippuric acid excretion of case 13 on admission was 080 g. and on discharge 0.80 g., whereas the figures of case 24 were 0.72 g. and 0.78 g. respectively in spite of more than four weeks' hospital stay in each case and marked clinical recovery.

While in practically all these cases there has been no diminution in the ability of the kidneys to form urine of high concentration, the figures of urea clearance test have been below normal or on the lower side of normal in most cases. Most interesting observations have been made on case 12, whose urea clearance was 58 per cent and hippuric acid 0.54 g. on admission. After a month's treatment in the hospital the urea clearance was 82 per cent and hippuric acid 1.24 g. These observations could only be explained on the basis of impaired kidney function due to the same factors which operate on the liver-passive venous congestion and anoxemia. Changes similar to liver are produced in kidney glomeruli lowering the blood supply and impairing the function of tubules.

The two cases of hypertensive heart failure (cases 20 and 28) gave initial low values 0.20 g. and 0.42 g. respectively. In spite of complete clinical relief the figures only rose to 0.56 g. and 0.58 g. respectively much below the average normal. While the small rise in hippuric acid excretion reflects the improvement in the congestion of the kidneys, the final low results are due to concomitant nephrosclerosis.

No significant relationship has been established between the histological findings, determined after liver biopsy on twelve cases of this series (cases 10, 19, 21, 23, 26, 27, 28, 29, 30, 32, 34 and 36) and hippuric acid excretion. Cases 27 and 30 both show patchy fibrosis but the results of hippuric acid excretions are 0.12 g. and 0.55 g. respectively, whereas hippuric acid excretion is 0.16. g. in case 19 with cloudy swelling and fatty degeneration. This is explained on the basis of hippuric acid synthesis which is a cell function. Low values of hippuric acid therefore indicate cell dysfunction. Whether the dysfunction is due to cloudy swelling of liver cells or due to fibrosis is beyond the scope of hippuric acid test to predict, except that in the latter the condition will be irreversible.

Discussion

The results confirm the conclusions reached by Carter and Maclagen (1946) that the liver efficiency tests bear no relation to ætiology of failure, number of attacks of decompensation and the size of liver. The hippuric acid exerction has been invariably found to be low in cases of right ventricular failure, a finding in agreement with Sherlock. The results ranged between 0.12 g. and 0.69 g. in thirty-four cases studied, with an average of 0.42 g. The findings of hippuric acid vary with the extent and degree of cardiac failure, the very low figures being of great prognostic value, inasmuch as all the four cases below 0.20

died within a short period.

The hippuric acid excretion test has proved a definite help in the follow-up of cases of cardiac failure. It shows a steady rise with the clinical improvement of the cases, whereas it fluctuates to lower and higher figures with the deterioration and relief in the clinical symptoms and signs of failure as seen in cases 8 and 25. These findings are consistent with pathology of cardiac liver. With the relief in passive congestion, the anoxemic condition of liver cells improves and automatically the liver function improves.

Both cases of left ventricular failure (cases 13 and 24) have given normal figures of hippuric acid excretion and show no increase in spite of clinical improvement. The cause is not far to seek. There is no passive congestion of liver and no dysfunction. The liver function tests have no place in judging the prognosis of left

ventricular failure.

A healthy kidney with normal renal function being a pre-requisite before the application of hippuric acid for liver function, urea clearance tests have been done in all cases. The figures of urea clearance have invariably been low in this series—a finding which has been disputed by Fishberg (1940). According to him the urea clearance is unimpaired and it was only when the engorgement of kidneys was severe and the oliguria extreme that subnormal results were found due to nitrogen retention. My findings are supported by Tiagi (1946) who concluded that 'Urea clearance is lowered when decompensation begins in cardiac cases and the extent of damage is not great, the function is more likely to recover when compensation takes place'. Case 12 also corroborates the above conclusion. Low values of urea clearance may partly be explained by the lower clearance of Indians—(to the extent of 60 per cent of American standard set up by Moller)-found by Gokhale (1941), Srikantia and Shamanna (1944), and Pai (1945).

Taking for granted that kidney function is impaired due to passive congestion, it must be admitted that congestion of both liver and kidney is due to cardiac failure and improves after treatment.

While hippuric acid test, therefore, may not be used as a measure of liver function in cardiac failure, it can certainly be used to measure the severity of congestive failure and to follow the progress of the case.

The prognostic value of hippuric acid test in cases of hypertension may not be conclusive.

On account of kidney damage low values are found; but the progress of the case can be watched all the same.

Summary

The intravenous hippuric acid tests have been carried out on 36 cases of congestive failure on admission, during treatment and on discharge and compared to the clinical state of the patients.

The hippuric acid excretion has invariably been found to be low in right ventricular failure corresponding with the extent and degree of cardiac decompensation and proved a definite help in the follow-up of cases.

The test has proved of no value, prognostic or

follow up, in left ventricular failure.

The causes of low urea clearance obtained during the present study have been discussed.

I am thankful to Dr. P. N. Wahi, M.D., M.R.C.P., for constant help in carrying out the tests in his department and to Dr. G. N. Vyas, M.R.C.P., Superintendent, Thomason Hospital, Agra, for permission to report this work.

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ON THE INHIBITION OF THE ACIDITY OF THE GASTRIC JUICE BY SPIRIT CAMPHOR

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Introduction

(a) The idea of administering spirit camphor originated from the relief obtained by having a drop or two of spirit camphor with a little sugar in a well-established case of peptic ulcer by an aunt of mine. She had a temporary relief of pain. after having the spirit.

Observations were then made in Pavlov and Heidenhain pouch dogs. These animals were prepared from the common pariah dogs. There were certain fundamental differences between the

two pouches.

Pavlov's pouch.—The main stomach was separated from the miniature stomach (pouch) completely by the intervention of the two layers of the mucous membrane, keeping the vascular and nervous connection (vagi) well maintained. So the gastric juice which was obtained was like that of the main stomach, in response to nervous and chemical stimuli, while the digestive process was going on in the main chamber, and this clear gastric juice unmixed with food was obtained through the pouch.

Heidenhain's pouch.—As the stomach was completely separated into two portions, the upper big and the lower small segments, the vagi nerves were completely separated from the lower smaller segment. The vagal connection then ceased to exist with the main stomach; the only link remained in the portal vascular channels and the sympathetic nervous connec-

tions through the blood vessels.

(b) Methods adopted to obtain the gastric juice.—Some suitable devices were adopted to keep the animals standing for 3 hours. At the beginning it was annoying to them, but later on they co-operated well. All psychological fears were eliminated. They were very jolly and became tame animals.

Just after the feed of the animals, a hæmocytometer tube, 4 inches in length, tapering at one end, with one or two eyes at the end was introduced up to one inch inside the pouch for drawing out gastric juice. Then a 25 c.c. glass beaker, encircled by a thin wire, 20 inches inlength with its two free ends united together at the back of the animal, was fitted for collection of gastric juice. It was the cheapest and the simplest device. The rubber tube didn't act as secretagogue.

After the feed the gastric juice was collected at intervals of half an hour for 3 hours. If the juice was less than 0.5 c.c. in any sample, no titration was done, as there would have been a great chance of error. It was mixed with the next sample till the quantity became at least 0.5 c.c. The titration was then done and the

results were expressed in relation to the time of the last collections, otherwise 1 c.c. of the juicewas titrated each time.

(c) Weight of the animals :-

(i) Pavlov I 10 kg. (ii) Pavlov II 13 kg. (iii) Heidenhain II 9½ kg.

(d) Time interval between the operation and collection of gastric juice.—There were intervals of at least 3 months in each set of animals.

(c) Feed: (i) 'Meat without extractive'.— Eight ounces of beef were boiled for one hour; the extractive was drained away and the meat was washed in tap water, leaving thereby no extractive.

(ii) ! Meat with extractive '.— The same quantity of the beef was boiled for I hour and about 4 ounces of water were left in the meat so extractive remained with the meat.

(f) Estimations of free hydrochloric acid and total acid: Procedure.—One c.c. of the gastric juice was taken into a 25 c.c. beaker and to it a drop of Toepfer's indicator was added: immediately the colour changed to pink. It was titrated with N/10 sodium hydroxide solution run through a microburette. The initial reading of the alkali in the microburette was recorded. The alkali was added drop by drop and the contents were mixed thoroughly by shaking till the colour changed to just canary yellow (Gradwohl, 1943). Srikantia et al. (1944) used Tropeolin oo in preference to Toepfer's indicator as Hori (in Japan) suggested there was a greater chance of error with the use of Toepfer's indicator.

Then a drop of 1 per cent phenolphthalein solution was added to the yellow coloured solution which was titrated further by N/10 sodium hydroxide solution till the contents of the beaker just turned into a permanent pink colour. At that point the reading of alkali was noted.

The difference between the first and the second reading gave the amount of free hydrochloric acid in 1 c.c. of gastric juice and between the first and the third reading gave the amount of total acid in 1 c.c. of the same. They were converted into percentage strength and were expressed in terms of numbers of c.c. of N/10 sodium hydroxide solution required to neutralize 100 c.c. of the gastric juice.

N.B.—Just to avoid the monotonous repetition of N/10 NaOH per 100 c.c. of gastric juice every time it has been expressed at places only as the number of c.c. and this should be taken to mean the amount of N/10 NaOH required

per 100 c.c. of gastric juice.

(g) Number of experiments done.—Four observations were not recorded. In each animal the individual basic curve was obtained with the 'meat without and meat with extractive' meal. Three successive observations were done in each; subsequently the spirit camphor was administered and a comparative study was done. The graphs show the average of three observations.

Experimental Observations

The following three experiments were performed to obtain quantitative data:—

Doses.—(a) 0.5 c.c. of spirit camphor in Pavlov I animal one hour after feed with 'meat without extractive'.

Dated 6-9-45 onwards.	Spirit camphor	Meat without extractive
(b) (c) (d)	Initial: 78.0 c.c. of N/10 NaOH per 100 c.c. of gastric juice. Maximum: 96.0 c.c at 1 hour Minimum: 0.0 c.c at 3 hours Any subsequent rise: Nil. See the end of the experiment Total acid:— Initial: 109.3 c.c Maximum: 125.3 c.c. (after spirit camphor) at 1 hour Minimum: 28.0 c.c at 2 hours Any subsequent rise: 53.0 c.c at 3 hours Total quantity:— 10.1 c.c.	97.3 c.c. of N/10 NaOH per 100 c.c. of gastric juice. 137.3 c.c at 1 hour 72.0 c.c at 3 hours 133.3 c.c at 2 hours 127.3 c.c at 1 hour 95.3 c.c at 3 hours Nil. See the end of the experiment. 15.1 c.c. 1st hour

(b) 1.5 c.c. of spirit camphor in Heidenhain II animal one hour after feed with 'meat with extractive '.

(c) 2.0 c.c. of spirit camphor one hour after feed in Heidenhain II and Pavlov II on 'meat

with extractive '.

(i) Spirit camphor 0.5 c.c. one hour after feed through (pouch) in Pavlov I animal.—The basic quantity of boiled beef without extractive was given and the collection of the juice was done and titrated as stated before at the interval of

half an hour. Immediately after the first hour collection of the gastric juice the animal was placed into a prone position and the spirit camphor 0.5 c.c. (B.P.) with a dropper was spurted into the pouch. The animal was maintained in that position for 5 to 7 minutes, then made to stand; the sampling tube was introduced and the whole content of the pouch was drained away. After the ejection of the last drop, the collecting beaker was fitted. The next sample of juice was collected, just after next half an hour, i.e. 11

hours after feed as before, and was titrated for free hydrochlorie acid and total acid.

The results are put into a tabular form.

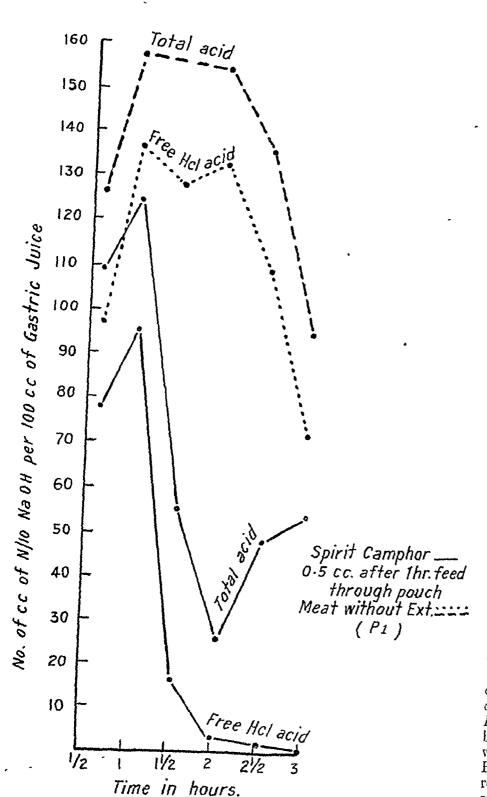
The recordings of the free hydrochloric acid and total acid just at the one-hour sample were 96/125.3 c.c. of N/10 NaOH per 100 c.c. of juice. After administration of spirit camphor, next sample of the gastric juice, i.e. 11 hours after feed, had a reading of free hydrochloric acid and total acid 16.6/55.3 c.c. of N/10 NaOH per 100 c.c. gastric juice respectively. A remarkable inhibition indeed by 79.4 c.c. (82.7 per cent) in free hydrochloric acid and 70.0 c.c. (55.8 per cent) in total acid. The next sample had a further inhibition; in this way the last sample had complete achlorhydria.

Total acidity.—This also had the inhibition but not to the same extent as that of free hydrochloric acid. The maximum level came down to 26.0 c.c. at second hour, followed by a subsequent rise up to last collection of the juice at three-hour period and that too was 53.0 e.c., much below the basic reading.

(b) Total quantity.—10.1 c.c., i.e. less than 5.0 c.c. of the basic meal, so there was an inhibition in the quantity also.

(ii) Spirit camphor 1.5 c.c. one hour after feed (meat with extract) through pouch in Heidenhain II.—The same basic quantity of boiled beef with extractive was given to Heidenhain II animals. The rest of the procedure was the same.

F16.1.



Dated 6-3-46 onwards.	Spirit camphor	Meat with extractive
	(a) Free hydrochloric acid:— Initial: 100.0 c.c. of N/10 NaOH per 100 c.c. of gastric juice. Maximum: (i) 110.6 c.c at 1 hour Minimum: 30.0 c.c at 2 hours (b) Total acid:— Initial: 112.0 c.c at 1 hour Maximum: 120.0 c.c at 1 hour Minimum: 48.0 c.c at 2 hours Any subsequent rise: 64.6 c.c at 3 hours (c) Total quantity:— 10.6 c.c. (d) Average quantity of juice per hour:— 1st hour 5.9 c.c. 2nd hour 5.9 c.c. 3rd hour 2.9 c.c. 3rd hour	69.3 c.c. of N/10 NaOH per 100 c.c. of gastric juice. 86.0 c.c. at 2½ hours 64.0 c.c. at 2½ hours 79.3 c.c. at 2½ hours 79.3 c.c. at 2 hours 98.6 c.c. at 2½ hours 8.9 c.c. at 2½ hours
Dated 16-3-46 onwards.	Spirit camphor	Meat with extractive
	(a) Free hydrochloric acid:— Initial: 77.0 c.c. of N/10 NaOH per 100 c.c. of gastric juice. Maximum: 92.0 c.c at 1 hour Minimum: 0.0 c.c. (throughout) Any subsequent rise: Nil. (b) Total acid:— Initial: 108.9 c.c at 1 hour Minimum: 113.3 c.c at 1 hour Minimum: 118 c.c at 3 hours Any subsequent rise: Nil. (c) Total quantity:— 16.8 c.c. (d) Average quantity of juice per hour:— 1st hour 9.3 c.c. 2nd hour 58 c.c. 3rd hour 5.3 c.c. 1 hour 53.3 c.c. 1 hours 0.0 c.c. 2 hours 0.0 c.c. 3 hours 0.0 c.c.	66.6 c.c. of N/10 NaOH per 100 c.c. of gastric juice. 83.3 c.c at 1 hour 66.6 c.c at ½ hour Twice. 79.9 c.c at ½ hours 79.9 c.c at ½ hour Nil. 12.4 c.c. 1st hour

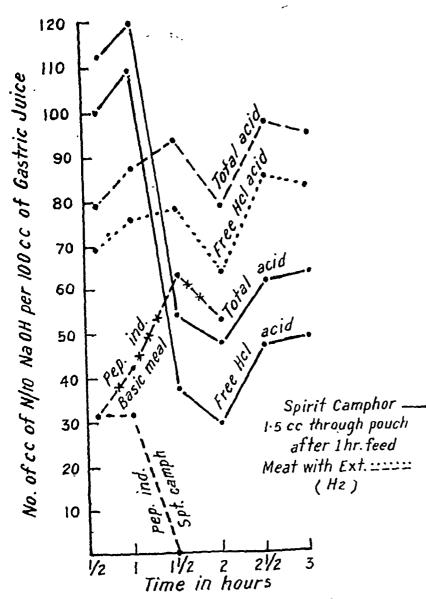
Comparative data:—

After the spirit camphor the acidity came down from 110.6 c.c. of N/10 NaOH per 100 c.c. of gastric juice at one-hour sample to 38.0 c.c. of N/10 NaOH per 100 e.c. of gastric juice at 1½ hours and the total acid from 120.6 c.c. to 54.6 c.c. at $1\frac{1}{2}$ hours, i.e. 65.6 per cent inhibition in free hydrochloric acid and 54.7 per cent in total acid respectively.

There was further inhibition of acidity but not to the extent as was found in the experiment no. 1. After the second hour both the

acidity had the climbing curve.

F1G. 2.



Extractive had its own influence of producing high acidity. As regards quantity it had a secretagogue effect. Peptic index also came to

zero with the fall of acidity.

(iii) Spirit camphor 2.0 c.c. one hour after feed (meat with extract) through pouch in Heidenhain II and Pavlov II.—This particular observation was done in the Heidenhain II and Pavlov II animals. After the usual preparation the gastric juice was obtained and titrated.

Comparative data:—

(a) Free hydrochloric acid.—The next sample of the juice after spirit camphor had a complete achlorhydria and that continued till last hour of the experiment.

(b) Total acid.—Total acid too had a considerable inhibition and at the last-hour period it was 11.0 c.c. of N/10 NaOH per 100 c.c. of

gastric juice.

(c) Total quantity.—16.8 c.c., i.c. more than

4.4 c.c. in comparison to basic reading.

(d) Peptic index.—Simultaneously with the acidity the peptic index also came down to zero, . so on acid no pepsin.

To overcome the effect of extractive, 2.0 c.c. of the spirit camphor

was sufficient.

Comments

It is known that the acidity curve varies from person to person and from time to time. In these experiments, in the initial reading with the spirit camphor recording, some animals start with less and some with more in comparison to the initial basic curve. The reason thus have been explained.

The pouch end administration had a good response, so the drug acted locally, not through any vagal connection which was ruled out in

Heidenhain's animals.

Summary

(a) Even with extractive 0.5 c.c. of spirit camphor could inhibit the free hydrochloric acid by 79.4 per cent and total acid by 82.7 per cent in Paylov I animal, and for a complete inhibition, 2.0 c.c. were effective.

(b) Without extractive it had a better response as regards inhibitory effect was concerned with less amount

of spirit camphor.

(c) With the fall of acidity the level of peptic index also came down. The peptic index was estimated by

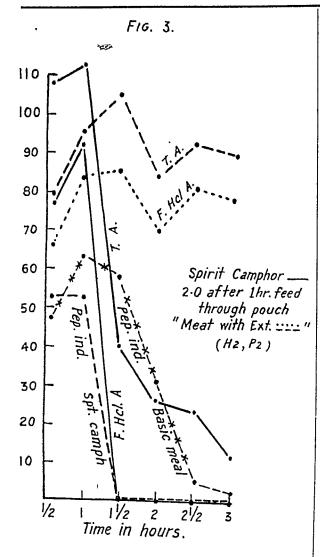
Fuld method.

(d) The work differed from that of Necheles and Mayer (1935) in that whereas in their case they had to use 6.0 to 8.0 c.c. of oil menth

piperata, whereas spirit camphor was effective to a great extent with 0.5 c.c. and to a full extent

with 2.0 c.c. only.

I am indebted to Dr. B. Narayana, M.Sc., M.B., Ph.D., F.R.S.E., F.N.I., Principal and Professor of Physiology, Prince of Wales Medical College, Patna, who helped me to prepare the Payloy and Heidenhain pouch dogs, and work whose guidance the present series of work and under whose guidance the present series of work was carried out as a Patna University Research Scholar.



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B, 20, 245.

PREVENTIVE VALUE OF PALUDRINE IN MALARIA

By K. L. BASU MALLIK, M.B. (Cal.) Chief Medical Officer, Ludlow Jute Co., Ltd., Chengail, District Howrah

Observations were made among the members of the Indian staff of the Ludlow Jute Mills and their family members during second half of 1947. The residential area is surrounded on all sides with water, namely, ground tanks, stagnant canals, railway borrowpits and the river. Incidence of malarial fevers has been quite high in the area. There are 8 families and

a bachelors' mess. Malaria incidence of 1946 is given to show comparative results. Treatment of all employees and their dependants is provided free of all costs and all medicines are supplied without any restriction whatsoever by the mill authorities.

Prior to 1947 and during the first six months of this year all malaria cases were treated with quinine; when quinine was in short supply quinacrine was used. During 1946 treatment was confined to quinine and quinacrine. For prevention of relapses daily doses of quinine or quinacrine was supplied but it was invariably found that there were omissions on the part of the patient and relapses resulted. This was due to the drawbacks of quinine and quinacrine, also to the inherent prejudice against both these drugs. Subjects of observation were:-

Adult ma	les				31
Adult fem	ales				16
	males	(between	2	and	
14)	• •			• •	23
	females	(between	2	and	
12)	• •	• •		• •	16
					86

During the latter half of 1947 I started administering paludrine to this population in a strictly regular manner. Co-operation of the head of the family was obtained in a wholehearted manner and every householder was given a card showing the names and ages of the members and the day and dosage of paludrine. As many of the children had relapses of malaria during 1946 and the first 6 months of 1947, those who had fever within a month were initially treated with a 5-day course of 3 tablets a day treatment although they were not suffering from any fever. There were 7 such cases of adults. Subsequently we placed all residents on a strict regime of prophylaxis with paludrine. They were kept under observa-Adults were given 1 tablet (0.1 gm.) on days a week usually Sundays and Wednesdays. Children over 10 years were given adult doses. Children between 2 and 9 were given ½ tablet twice a week. The comparative results were as shown in the table.

It would appear that during the second half of 1947 when the observations were made there was not a single case of malarial attack among the families of residents, although malaria was raging in the immediate vicinities in epidemic form. The incidence of 7 cases among members of bachelors' mess was due to the fact that they invariably forgot to take paludrine with them when they went home at week-ends and were practically taking 1 tablet a week.

There was no sign of any toxicity whatsoever not even in small delicate children.

This series though small substantiates the claim made by the English manufacturers for

TABLE

		Malarial attacks		
		1946	1947	
	Members	January- December	January- December	
Family 1 " 2 " 3 " 4 " 5 " 6 " 7 " 8 Bachelors' mess	12 2 2 6 8 10 9 4 33	9 0 0 4 4 7 9 6 26	0 0 0 0 0 0 0 0 0	
and servants.	86	65	7	

paludrine tablets as a causal prophylactic in preventing malaria.

SEROLOGICAL TECHNIQUE (contd.)

By S. D. S. GREVAL

LIEUTENANT-COLONEL, late I.M.S.

(From the Laboratory of the Serologist to the Government of India, School of Tropical Medicine, Calcutta)

A MICROTECHNIQUE OF COMPLEMENT FIXATION

THIS technique should only be undertaken by workers with considerable experience of the ordinary technique. It is employed on 3 When the volume of the material to be tested is small. Small volumes of the reagents are then added to small volumes of the material in Durham tubes or quill tubes. 0.1 c.c. can be delivered by an ordinary 1 c.c. pipette marked in 10 divisions. Smaller volumes are delivered by means of a capillary teat pipette. CSF is often tested by this technique. (2) When an ordinary water bath or an air incubator is not available. The reaction is then done in a small water bath which can be kept at blood heat without special contrivances. (3) When the hæmolysis must be watched continuously. Such a need there is in studying the preliminary reaction of weak therapeutic antisera with a view to adjusting the dose for a final

standard test. The bath.—The accompanying photograph shows the bath (figure 1, plate XIV). It can be made by any tinsmith. (The bath in the photograph is made of copper. It can also be made of 'tin' from a kerosene oil tin, and The glass is fixed with putty and enamelled.) the junction is water tight at blood heat.

A thermometer is fixed in a corner by plasticine.

The bath is placed on two tripods and is filled to the required level (less than 3) with water at 37°C. A small burner or a spirit lamp placed under it will keep it at the same temperature. The wick of the lamp is regulated for the

The bath has been in use at the Central Research Institute, Kasauli, for many years. It was described by Major H. C. Brown, I.M.S., in 1915, in the Indian Journal of Medical Research,

volume 3, page 104.

The rack.—The accompanying photograph (figure 2, plate XIV) shows the plasticine rack. A piece of wood is weighted with lead and provided with arms made of wire. On it is spread plasticine. Durham tubes or quill tubes are set in the plasticine. Sets of tubes are marked as shown in the figure.

Miniature rods, made from a drawn glass rod, are used as stirrers. They are left in the tubes.

When an air incubator is available this rack is not necessary. The tubes are then placed in the rack used for the micro-Kahn test (this Journal, vol. 82, 1947, April number, plate X) and incubated.

The pipette.—A capillary teat pipette is used for picking up small equal volume (less than 0.1 c.c.) separated by air bubbles. (The top volume is discarded.) The volume is standardized by picking up quickly from a greased and polished glass surface (of watch glass or slide) a volume of 0.07 c.c. saline measured by Kahn pipette.

The same pipette is used for all sera or CSF's after washing 3 times from each of two beakers of saline: the pipette is filled from these beakers

and discharged into a third beaker.

For a small-volume test the tubes discarded as too small for the micro-Kahn test are used.

It is desirable that the whole test including the titration of the complement should be carried out by the same volume. This is indispensable for comparing results. For work not needing comparision and critical assays the MHD may be taken from the routine, it must, however, be remembered that partly hæmolysed rbc in a tube of ordinary size look more turbid than in a miniature tube.

STUDIES ON RINGWORM

Part VI

RINGWORM OF THE GLABROUS SKIN A STATISTICAL SURVEY

By L. M. GHOSH

D. PANJA

and

N. C. DEY

School of Tropical Medicine, Calcutta (Financed by the Indian Research Fund Association. New Delhi)

This is a report on the investigation of the common fungi causing ringworm of the glabrous skin with special reference to determine the incidence of Trychophyton infection of the skin in and around Calcutta. It is a common the skin is an belief that ringworm of epidermophyton infection and the epidermophytosis is widely and rather loosely used by physicians for any ringworm lesion of the skin. There is no published record in India which gives any idea as to the prevailing or common fungi causing ringworm in this country. Records published in other countries give widely divergent figures and it seems that each country has a fungus of its own, e.g. Epidermophyton floccosum in the U.K., Trichophyton gypseum in America and Trichophyton purpureum (Epidermophyton rubrum) in China. In the previous paper (part V of this series) on the study on ringworm of the nails it was found that contrary to the popular belief Tr. purpureum (E. rubrum) was more common than E. floccosum. With a view to confirming the previous findings and preparing statistics of the incidence of the common fungi causing ringworm of the skin in India, 700 cases of ringworm of the skin were studied. Excluding infection of the nails which was studied and published in the previous paper these 700 cases comprised ringworm infection in all the other parts of the body and the clinical diagnosis of each was confirmed by microscopic and or cultural findings. The cases studied were consecutive and no selection was made as to the site of infection.

Method of study.—In each case the clinical diagnosis was confirmed by microscopic examination and for this a solution of sodium sulphide was used as it has a much quicker and better cleaning and keratolysing action than the standard solution of caustic potash. The only drawback of this solution is that it has to be prepared fresh and kept in tightly fitting glass stoppered phials. The solution does not keep more than a week. (Saturated solution of sodium sulphide in distilled water with equal

parts of rectified spirit. The rectified spirit is added slowly and shaken till the solution is quite

Cultures were put up simultaneously in Sabouraud's proof medium and Sabouraud's medium with the addition of gentian violet solution. Subcultures were put through various solid media for the study of the growth, pigment formation and other cultural characters. Observation on the formation of spores and other end-organs were as usual made on Welledslide preparations (hanging drop preparations in a viscid media). Wheat-starch-water medium was found most suitable for this study. The analysis is briefly tabulated below:

Total number of cases-700.

Number of cases from which the fungi were isolated—635.

Table I Species identified

Epidermophyton floccosum Trichophyton purpureum	211	or	33.23	per cent.
(Epidermophyton rubrum).			63.00	,,
Trichophyton gypseum Trichophyton violacium			2.36 1.40	"
Trichophyton violacium	3	or	1.40	**

When these figures are compared with the published records of other countries it becomes obvious that in each country one particular species is predominant over the other species and this predominant species is different for different countries (table II).

Particular care was taken not to miss any fungus from cases where the feet and the hands were involved especially the digits and the interdigital spaces, because the infection of the feet and the toes is a common complaint throughout the world and very persistent in spite of treatment. The statistics of ringworm infection of the skin in the western countries are based mainly on the infection of the feet.

In table III is given the figures showing the infection in the different parts of the body.

Showing the comparative incidence of the species of ringworm fungi in different countries infecting the glabrous skin

Country	Tr. purpureum (E. rubrum), per cent	E. floccosum, per cent	Tr. gypseum, per cent	Tr. violacium, per cent	Other species, per cent
India China United Kingdom (Eng.) America (U.S.A.)	63.00 81.58 29.00 18.33	33.23 7.90 44.50 3.25	2.36 26.50 75.42	1.41 10.52	3.00

TABLE III

	Hands and fingers	Feet and toes	Groin area	Other places
Total number Tr. purpureum (E. rubrum) E. floccosum	153	157	- 132	193
	104 (67.9%)	90 (57.3%)	86 (65.13%)	120 (62.1%)
	45 (29.4%)	60 (38.2%)	40 (30.3%)	68 (35.2%)

From tables I and III, it is obvious that Tr. purpureum (E. rubrum) is more common than E. floccosum in causing ringworm infection of the glabrous skin in and around Calcutta which may be taken as a standard figure for India.

Analysis of the figures from the different parts of the body shows the same preponderance of *Tr. purpureum* over other species. This study also confirms the findings of the previous observations on the infection and the nails.

Summary

- 1. Seven hundred cases of ringworm infection of the glabrous skin (excluding nails) were studied and the fungi isolated for identification of the species.
- 2. Tr. purpureum (E. rubrum) was found to be more common than E. floccosum.
- 3. The figures have been compared with the figures of the other countries.

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ERRATUM

PRESUMPTIVE MALARIAL PNEUMONIA

By ROBERT HEILIG, M.B., F.N.I.

Chief Physician

With the assistance of GULAB CHAND SHARMA, L.M.P., D.M.R. (Madras)

Assistant Radiologist, S. M. S. Medical College Hospital, Jaipur

(Indian Medical Gazette, 83, March 1948, p. 116)
FIGURE 7, plate VI of the above article was reversed during printing.

A Mirror of Hospital Practice

LUNG ABSCESS WITH PYO-PNEUMO-THORAX TREATED WITH PENICILLIN

By J. S. RASTOGI, M.B., B.S.

Medical Officer In-charge, Tuberculosis Clinic,

Moradabad

PATIENT K. S., 36 years, Hindu male, was examined on 1st November, 1947, with the following complaints:—

1.	Temperature ranging between		
	101°F. and 105°F.	40	days.
2.	Cough	40	•
3.	Offensive sputum and breath	20	•
4.	Loose motions	15	1,
5.	Sticky and foul-smelling per-	10	"
_	spiration	15	••
6.	Breathlessness	6	

Present illness.—The patient was a mate on the pan-floor* in a sugar factory in Rampur State. Communal disturbances broke out in the State during September 1947. He flew from there to save himself. At that time he got a severe attack of cough and cold. After a few days he developed pain on the left side of his chest. He, taking it to be an attack of pneumonia, took a few tablets of M.&B. 693. In the meantime he developed a severe dry cough with persistent high temperature. Pain also increased. He consulted various indigenous medical men, was differently diagnosed as typhoid, tuberculosis or pneumonia and was treated for a few days by each one of them but without relief.

On about the 15th day of his disease he developed high fever and severe cough with blood-stained sputum. He was examined by a doctor who diagnosed him as a case of pneumonia and kept him on sulfa drugs for one week. His condition grew worse. Offensive odour appeared in his breath and sputum. Treatment was thereupon switched on to a vaidya who diagnosed him as a case of pulmonary tuberculosis and he was getting Basant kusmakar, etc., when I was called in.

Examination.—On entering the room, the most striking thing was the extreme fetor. The patient was lying in the bed slightly propped up. He looked very seriously ill. Body was emaciated and wet with perspiration. Breathing was rapid and shallow. Temperature 104.6°F. Pulse 140 per minute with low tension. Clubbing of fingers present.

Inspection.—Left side of the chest showed diminished movement, intercostal spaces were full and apex beat visible about ½ inch interior to the nipple line in the 5th space.

Palpation.—V.F. decreased in the upper part but increased in the middle zone of the left lung.

Percussion.—There was increased resonance in the upper part of the left side of chest but there was dullness lower down with considerable resistance underneath amounting to wooden dullness.

Auscultation.—No breath sounds were audible in the upper part of left lung. They were tubular lower down and changed to vesicular with expiration prolonged at the base. No adventitious sounds were heard in the upper

^{*}Pan-floor means the place where the vacuum pans (big iron pans fitted with thermometers) for boiling sugar crystals are located. The solution of sugar is heated to a certain temperature in one pan and then transferred to another.

part but a few rhonchi were heard along with coarse crepitations at the base.

On the right side of chest there were no special physical signs except for a few crepitations at the base.

Examination of abdomen.—Spleen slightly

palpable.

Pathological examinations: Sputum.—Sputum examination showed abundance of pus cells, elastic tissue, streptococci, staphylococci and pneumococci. No acid-fast bacilli were detected.

Blood smear.—Showed marked polymor-

phonuclear leucocytosis.

Urine.—Sugar and albumin negative.

Stool.—No ova or cyst.

An exploratory needle was put in to collect material for detailed examinations but it was unsuccessful.

X-ray examination.—Figure 1, plate XIV shows an area of opacity in the lower half of the left side but the left costophrenic angle is clear. The opacity in the upper part is well marked out in a straight line and there is air above it. The collapsed lung lies along the mediastinum.

Diagnosis.—The history, the symptoms specially the fetor of breath, leucocytosis and the x-ray picture left no doubt regarding the diagnosis. In differential diagnosis the following

were considered :-

Pulmonary tuberculosis.—The history and the distribution of signs were similar to pulmonary tuberculosis specially when complicated with spontaneous pneumothorax but the points against were: 1. Patient looked more acutely ill. 2. Sputum was negative for acid-fast bacilli. 3. Presence of offensive odour in breath and sputum.

Gangrene of lung.—The distinction is not always easy, nor was it so in this case. The extreme gravity of the patient's general condition, the horrible fetor of breath and sputum were all present. In fact it was almost impossible to decide between the two. As fundamentally the two processes are similar, difference being only of degree, diagnosis of abscess of lung has been adhered to.

Interlobar empyema, purulent bronchitis and bronchiectasis were all ruled out by the distribu-

tion of signs and the skiagram.

Spontaneous hamopneumothorax.—It is usually of sudden onset in a previously healthy person or in a tuberculous patient receiving A.P. treatment. There are signs of internal hamorrhage and effusion accumulates more rapidly. Onset is marked with shock and pain. All these symptoms were absent here.

Amæbic abscess.—Lung abscess secondary to the amæbic abscess of liver bursting into the lung is commonly found on the right side. Patient gives a positive history of dysentery, high fever, and pain. Liver is enlarged and tender. Stool examination is positive for E. histolytica. All these were absent in this case.

Tumour of lung.—This may sometimes be accompanied by abscess formation. The age of the patient is usually more. This condition is differentiated by help of bronchoscopy and lipiodol investigation.

Treatment.—The general treatment consisted in improvement in the ventilation of the room, general cleanliness around the patient and administration of plenty of fluids. Tineture benzoin co. inhalations by means of a Nelson's

inhaler were given every four hours.

The special treatment.—It consisted in: (1) Withdrawal of air from the pneumothorax cavity in order to relieve dyspnæa. (2) Administration of two lac units penicillin dissolved in 10 c.c. of double distilled water intrapleurally by a single injection. The following shows the special treatment given:—

Date	Initial pressure	Air withdrawn, c.c.	Final pressure	Dose of penicillin, Units		
3-11-47 4-11-47 5-11-47 6-11-47 7-11-47 8-11-47 9-11-47	+14 +16 +10 +12 +8 +10 +4 +6 +2 +5 D i s c	300 300 200 150 150 o n t i n	+4 +6 +2 +5 ±0 +2 ±0 +2 -4 ±0 u e d	200,000 200,000 200,000 200,000 200,000 200,000 200,000		

Under this treatment the symptoms and the signs began to disappear very rapidly. Temperature came down to 101°F. within 24 hours and speedily reached normal within 48 hours. The horrible fetor of breath and sputum decreased in 48 hours and disappeared in 72 hours. Cough decreased gradually and disappeared in 4 days. The general condition improved after 24 hours. Toxic diarrhæa and perspiration stopped, appetite improved and in one week's time the patient was fit enough to be moved safely for another skiagram, figure 2, plate XIV, which shows the amount of improvement affected within that time. Gradually pus and air have been absorbed and the lung has expanded. Patient remained under observation for one month and figure 3, plate XIV shows the end-result. He has shown steady progress without any set-back. There is evidence of marked fibrosis in the left lung as was expected after such a process. Lung has expanded. Heart and mediastinum have been pulled on the same side.

Comment.—Lung abscess has been defined as a localized purulent infection of the lungs. It includes any circumscribed collection of pus formed in the lung tissue, but softened tuberculous areas and bronchiectatic accumulations

are usually excluded.

Abscess formation is a manifestation of the result of continued action upon the body tissues of a bacterial irritant. If the infection is mild, suppuration may be avoided, but if the infection is of greater severity, tissue destruction is

extensive and suppuration results. The term gangrene is often erroneously used as though it were entirely different from abscess; but the two are fundamentally the same. The difference between abscess and gangrene is one of degree rather than of kind. It may be convenient to separate them clinically but it is not always possible to draw a sharp line of differentiation between the two.

Conditions which predispose to abscess formation are the diseases producing general cachexia or malnutrition notably diabetes and chronic alcoholism; also any condition leading to diminished resistance locally in the lung such as injury, disease or exposure. The exciting causes are the pyogenic organisms which reach the lungs either by inhalation, extension or circulation. The common organisms are streptococci, staphylococci and pneumococci. Other organisms as pneumo-bacillus, Bacillus welchii, B. coli and anærobic organisms may be present.

Pulmonary abscess may be formed under the following conditions:—

- 1. Inhalation of foreign septic material, e.g. after operations on nose, nasopharynx, larynx or teeth.
- 2. As a result of lobar or lobular pneumonia are called meta-pneumonic.
- 3. Embolic, e.g. in pyæmia, otitis media, septic thrombophlebitis or amæbic abscess after dysentery.
- 4. Contiguous spread from adjacent diseases, e.g., in bronchiectasis, ulcerating new growths of the lung, bronchi, œsophagus or mediastinal glands; in caries of vertebræ or ribs; in suppurative mediastinal glands; and in rupture of an empyema, or a sub-phrenic liver abscess, or infected hydatid cyst of lung or liver.
- 5. As a sequel of perforating chest wounds or fractured rib piercing the lung.

Meta-pneumonic or foreign body abscess is generally single and large but embolic abscesses are usually small and multiple. In extension abscess, the contiguity can always be made out.

This patient has been in employment of the sugar factory for the last 14 years. The only obnoxious gas that can be inhaled there is SO₂. He, by way of his employment as a mate on the pan-floor, does not come in contact with this gas, though occasional inhalation may not be out of question. It is therefore very uncertain whether his employment in the sugar factory acted in any way as a predisposing factor by lowering the local vitality of lungs. It is, however, beyond doubt that his vitality was lowered as a result of worry and strain during communal disturbances, and this surely acted as a predisposing factor. Most probably he got an attack of pneumonia which due to civil disturbance was neglected and became resistant. The onset is thus insiduous as is revealed by his history. Fetor in breath and bloodstained sputum appeared when the abscess burst

into the bronchus which was followed by the discharge of foul pus-like sputum. The bouts of cough show that the time intervening between them was taken for the cavity to fill. Dyspnæa synchronized with the development of pneumothorax. Skiagram has been most helpful in deciding about the diagnosis. Prognosis in such cases is very grave. Condition of this patient was very serious at the time of the first examination. Treatment was immediately started with intrapleural penicillin. thought to supplement the intrapleural route with systemic injections but observation and the result produced within 24 hours encouraged to continue with intrapleural penicillin only. Intrapleural penicillin acted as a topical application or an internal dressing over the diseased part and thus produced the maximum therapeutic effect in the minimum time. Result produced was dramatic and improvement beyond expectations. The case is still on the follow-up list and there is steady progress. Figure 3, plate XIV shows the amount of fibrosis that has developed to make good the damage to the lung parenchyma. Result has thus been ideal.

A FATAL CASE OF SEMINOMA WITH METASTASES IN LUNGS

By D. K. DUTTA, L.M.P., LT.M.
A. O. C. Hospital, Digboi

An Assamese Hindu male, aged 29 years, was admitted to the A. O. C. Hospital on 12th February, 1948, with a large swelling on the left testis—duration 1½ years: no history

of injury.

Condition on examination.—A hard swelling, slightly irregular in outline, moving freely within the scrotum and non-translucent. The epididymis and the cord were unaltered and felt normal. No testicular sensation was present and no enlargement on any other gland could be detected. The chest on physical examination was found normal but no skiagram Orchidectomy at the of chest was taken. external abdominal ring was done and the testis weighing 2 lb. was removed. Wound healed up and patient was discharged from hospital on 27th February, 1948. The cut surface of the tumour was yellowish: more or less homogeneous with areas of extensive necrosis and of small hæmorrhages. The tumour was sent to Pasteur Institute, Shillong, for histological examination and the report was '... the tumour appears to approximate to the description of seminoma. There is little evidence to suggest chorionepithelioma.... There is no evidence of tubercular infection either histologically or after acid-fast staining for bacilli'.

The man was re-admitted to hospital on 20th March, 1948, with effusion on the left side of the chest accompanied with dyspncea, irregular low

SEROLOGICAL TECHNIQUE : S. D. S. GREVAL. (O. A.) PAGE 272



Fig. 1.—Water Bath. Bottom and side walls are made of uninterrupted metal. Front and back walls have glass windows.

The scale (in inches) indicates the dimensions.

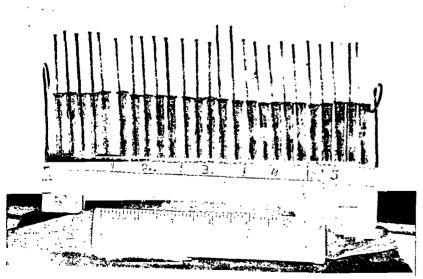


Fig. 2.—Plasticene Rack.

The scale (in inches) indicates the dimensions.

LUNG ABSCESS WITH PYO-PNEUMOTHORAX TREATED WITH PENICILLIN: J. S. RASTOGI. (M. H. P.) PAGE 274



Fig. 1.

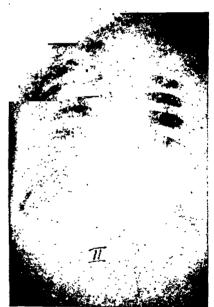
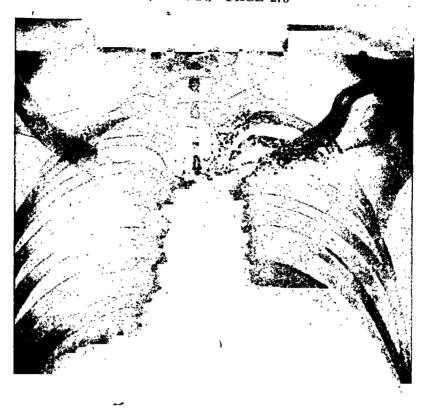


Fig. 2.



Fig. 3.

PLATE XV
A FATAL CASE OF SEMINOMA WITH METASTASES IN LUNGS : D. K. DUTTA:
(M. H. P.) PAGE 276



TWINS AND THEIR MEDICO-SOCIAL IMPORTANCE : K. A. SHAH. (C. T.) PAGE 294



The Dionne quintuplets on their fifth birthday.

fever and persistent cough with scanty expectoration: clinically, the base of left lung was woodydull, V. R. much diminished and breath sounds Tubular breathing almost inaudible. evident at the left apex and moist râles at right base. Heart was pushed to the right side. Diagnostic puncture produced sanguineous fluid, which contained no organism either on direct smear or on culture; lymphocytes predominated in the fluid. Skiagram of chest showed fluid in left chest and opacity of right base, perhaps an area of metastatic infiltration (plate XV). Repeated aspirations of fluid were done to relieve respiratory embarrassment. The patient died on 5th April, 1948.

From the above findings, the condition was obviously a seminoma of testis with metastases in both lungs, a rare disease which is seldom encountered in our day-to-day practice.

My thanks to Dr. A. S. Prowse, M.B. (London), C.M.O., c/o A. O. C. Hospital, for kindly permitting me to publish this case, also to the Director of Pasteur Institute, Shillong, for the histological examination.

Therapeutic Notes

NOTES ON SOME REMEDIES

XXI.-DRUGS IN ANAEMIAS, Part V

By R. N. CHAUDHURI, M.B. (Cal.), M.R.C.P. (Edin.), T.D.D. (Wales)

Professor of Tropical Medicine, School of Tropical Medicine, Calcutta

3. Tropical Macrocytic Anamia

As this anæmia is common in India, it is described more fully than originally intended.

Features are like those of pernicious anæmia but free hydrochloric acid is usually present in the gastric juice. Diarrhea is common. There is no spinal cord involvement.

Dietary deficiency plays an important part, and the condition is aggravated by pregnancy. Malaria and intestinal infections (e.g. ankylostomiasis, enteritis, dysentery) are supposed to be the chief precipitating factors. It occurs in both sexes and at all ages. During the last war large numbers of cases were seen among the Indian soldiers, most of them occurring among the vegetarians.

The current teaching based on the work of Castle postulates that nutritional macrocytic anæmia is due to deficiency of the extrinsic factor which is contained in our diet. This in turn leads to deficiency of the liver principle resulting in blood changes indistinguishable from those of Addisonian pernicious anæmia and which can be cured with liver. Wills and Evans (1938) contend that it is not the extrinsic factor

that is deficient, as it does not respond to purified liver extract such as anahæmin and examan (it has since been found that there may be brisk response to large doses) but to crude extracts such as campolon, or to large doses of marmite which has rarely any action on pernicious anæmia. They therefore think that this anemia is due to deficiency of a factor or factors belonging to vitamin B2 complex and that in its absence there is failure in the maturation of the red cells. The extrinsic factor theory still holds the field but the record discovery of what appears to be the liver principle (vitamin B₁₂) may help in elucidating this problem.

In addition there is iron deficiency in many cases and owing to this dual combination Trowell has called the anemia dimorphic. Napier (1947) points out that the anæmia has a hæmolytic and non-hæmolytic type, the former associated with a large spleen possibly

of malarial origin.

Very little is known about the nature of the extrinsic factor. It is present in meat and probably all forms of animal protein. Rice polishings, green vegetables and fruits are said to contain fair amounts, and milk and dairy products are thought to contain only very little. It should be noted that meat is more effective than milk in treatment.

Clinical features

The initial symptoms are loss of appetite and epigastric discomfort after taking food. Attacks of diarrhea are common and there may be steatorrhea but the fat content of fæces is not high as in sprue. Some complain of sore tongue and even dysphagia. The patient gradually becomes weak and loses weight. Sometimes there are varying degrees of fever. Paræsthesias, e.g. burning of the soles of the feet, are common but there is no paralysis as in pernicious anæmia. There may be signs of nicotinic acid, thiamin or riboflavin deficiencies. Gastric analysis shows hydrochloric acid but usually it is below the normal level. X-ray picture of bowels is negative. The anæmia is often severe and of macrocytic type with megaloblastic marrow. In gross forms the R.B.C. may be below 1 million per c.mm. The colour index is usually above 1. any reduction below it suggests an iron deficiency. In fact the blood picture may vary according to the relative preponderance of the two

deficiencies (hæmopoietic principle and iron). A total leucopænia due largely to neutropænia is a feature in most cases. As the disease progresses, the patient develops a distaste for food which with the sore mouth and tongue increases the deficiency. Thus a vicious circle is formed and the patient takes to bed becoming steadily weaker and more apathetic. Œdema develops owing to hypoproteinæmia. At this stage respiratory infections are common

and prove often fatal.

In pregnancy the disease occurs at a late stage. The edema of the legs and a trace of albumin in urine may be mistaken for signs of toxemia but the blood pressure is normal or low. The signs tend to improve after child-birth, but may become worse in a few refractory cases.

Treatment

Mild cases improve if a diet can be given containing meat, green vegetables and fruits. Egg yolk is said to be efficacious. Severe cases must be treated with liver or liver extract, a suitable preparation of yeast or folic acid. Iron is given as required.

Crude liver extract by injection is given as in pernicious anæmia, but cases showing severe signs and pregnant women demand a larger dosage. Extra liver can be given by mouth, its advantage being that it supplies other deficiencies in the diet. Marmite is effective if 1 oz. is given daily, but most Indian patients find it difficult to take this large amount.

The hæmopoietic response with liver is good but more prompt response has been reported with folic acid, the reticulocyte crisis occurs about the sixth day followed by a rapid and steady rise in red cells and hæmoglobin, and the marrow resumes a normoblastic pattern. At the same time the patient eats more and feels stronger, the sore mouth improves and the diarrhea gradually subsides. Good results have been reported by Das Gupta and Chatterjee (1946) in selected cases of nutritional macrocytic anemia. Goodall et al. (1948) recently described their results with 10 patients, 4 of whom were women with very severe anæmia after child-birth. The response was rapid and effective, except in two cases, one of which was complicated by bacillary dysentery and the other by hepatitis and jaundice. Spies et al. (1948) reported a satisfactory clinical and hæmopoietic response in each of 32 cases of nutritional macrocytic anæmia in relapse. Recently we encountered two cases which responded poorly to folic acid but subsequently well to liver injections.

After cure there is no need for liver or folic acid if the patient can arrange to have proper food.

III. SCURVY (VITAMIN-C DEFICIENCY)

An infant requires 30 mg. (average content of half an orange) of ascorbic acid and an adult 75 mg. per day. These requirements are increased during periods of rapid growth, in pregnancy and during lactation or during febrile states. Citrous fruits, black currants and tomatoes contain large amounts of vitamin C; sprouted grams are also fairly rich in it. Overcooking destroys the vitamin in vegetables. It is present in insufficient quantity in fresh

milk and is easily destroyed by boiling. As a prophylactic babies, whether breast fed or artificially fed, should be given as a routine sweetened orange juice at least one teaspoonful daily in the first month increased to four teaspoonfuls by the end of the third month. Tomato juice in double these amounts is equally efficacious.

In scurvy, along with the usual signs and symptoms, a hypochromic or normochromic normocytic anæmia is present. In latent cases the only symptom may be anæmia which responds to vitamin C but not to iron. In frank cases it is best to start with synthetic preparations of ascorbic acid, one to two tablets of 50 mg. being given twice daily by mouth; in severe cases it can be given parenterally from 2 c.c. ampoule containing 100 mg. or more. During convalescence ample fruit juice and also iron should be given.

IV. THYROID DEFICIENCY

Anæmia is not an infrequent finding in myxœdema, whilst a mild degree of hypothyroidism may be present in other anæmic states such as pernicious anæmia and prevent complete until thyroid is administered. The anæmia is usually macrocytic, but may be normocytic. It responds to thyroid treatment, though slowly. Associated iron deficiency is common and deficiency of the hæmopoietic principle is sometimes found; in such cases thyroid should be combined with the appro-priate hæmatinic. The dose of thyroid extract (thyroideum, B. P.) is ½ to 5 gr. but it is wise to start with a small dose of 1 gr. daily and gradually increase it to a level which is sufficient to rid the patient of symptoms. The majority of patients remain well at a maintenance dose of 1 to 2 gr. daily.

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EXPERIENCE WITH NICOTINIC ACID

By NANDALAL BAJAJ, L.S.M.F.

Sadar Bazar Dispensary, Delhi,

NICOTINIC acid was formerly known as the P.P. factor of vitamin B complex and considered to be useful for the treatment of pellagra only.

I have recorded its therapeutic value in pellagra in my article published in March 1939 in the Indian Medical Gazette. Since then it has been utilized in a fairly large variety of ailments, e.g. glossitis, stomatitis, delirium, headache, restlessness, cirrhosis liver, trigeminal neuralgia, angina pectoris, cerebral thrombosis, Mèniére's disease, asthma, deafness, alcoholic psychoses, lupus erythematosus, gastric ulcer and peripheral encouraging failure with cardiac Hypertensive, migrainous, idiopathic headaches and headache following lumbar puncture, which have so far baffled other forms of therapy, have improved some times miraculously rapidly with this drug.

Its main action is dilatation of the peripheral blood vessels which lasts for about 20 minutes and sets in only a few seconds after its intravenous administration, but after some minutes

if taken by mouth.

Patients at first feel heat and a tingling sensation in the nape of the neck, then on forehead and face, and lastly over the entire body.

Here and there a patient, on account of the intensity of these sensations, may actually ery out to be taken out of the furnace created by the severe heat. No fatalities have occurred and I have met with none in over 200 injections given by me so far.

The route adopted by me generally is the intravenous one. Time and space do not permit of a lengthy description of its actions and therapeutics. Suffice it to say that it has proved to be a very useful and inexpensive drug for some of the very serious and important diseases which had hitherto presented many difficulties in treatment. Some case reports are presented.

It was the relief of cephalgia following lumbar puncture with this drug which aroused my interest to fathom its field of usefulness and applicability in various painful conditions, especially the visceral pains.

Vitamin B complex ampoules were also tried

and found effective.

Nicotinic acid 50 mg. in 10 c.c. distilled water was injected intravenously in each case except where noted otherwise.

The various cases treated by me fall under the following:

1. Renal colic due to calculus, etc.

In all seven cases were treated:-

(a) M. D., aged 50, came with subacute renal colic of four days' duration, becoming aggravated at times; was cent per cent relieved in a few minutes after the injection.

(b) Renal colic, duration one day, 50 per cent relief there and then, and the rest vanished slowly in three or four hours (50 mg. intravenously in

10 c.c. distilled H₂O).

(c) Dull ache over renal area due to calculus (previous history of attacks), was relieved a good deal, nearly 50 per cent by this injection there and then, and further pain stopped in an hour.

(d) Nura, aged 25, M.M., with terribly severe right renal colic (previous history of attacks and passing gravel), relieved completely by 100 mg. intravenously in half an hour but pain recurred after eight hours. This occurs with morphia even

(e) C. L., aged 45, H.M., left renal colic of seven days' duration, previous history obtained, 50 per cent relief in half an hour after one injection of 100 mg. intravenously and the pain dis-

appeared completely in four hours.

(f) Buddha, aged 70, H.M., left renal colic of eight days, constipated. Within half an hour, relief set in and the patient was absolutely painfree in 5 hours though restless, probably due to

constipation.

(g) Dina, aged 50, had very severe left renal colic. Given 50 mg. of nicotinic acid intravenously, was relieved 50 per cent only, the rest of the pain being removed by taking 2 tablets of the same after four hours. During the next four days the pain recurred but was relieved with nicotinic acid 100 mg. two or three times a day (orally).

2. Five cases of biliary colic due to cholecystitis or gallstones, etc.

(a) F. K., aged 50, H.F., chronic cholecystitis with an acute attack of biliary colic, 50 mg. intravenously of the drug hardly produced any relief.

(b) Bashir—chronic cholecystitis—came with acute relapse, morphia injection produced temporary relief followed by nicotinic acid 100 mg. intravenously produced only 12 per cent to 15 per cent relief of pain. (Precise pathology of the disease uncertain—empyema of the gall-bladder?).

(c) Budho, aged 48, F., chronic cholecystitis of 18 years' duration, very severe biliary colic, 50 per cent of pain disappeared with nicotinic acid 50 mg. intravenously but reappeared after

24 hours (cancer of gallbladder?).

(d) Mariam, aged 40, M.F., chronic cholecystitis with acute relapse of pain, etc., restless, cold perspiration on the forehead, duration 12 hours, 100 mg. intravenously relieved half the pain there and then and in an hour was

absolutely pain-free.

(e) Kalavati, aged 32, H.F., came with very severe biliary colic of 12 hours' duration. Pain was felt both over the gallbladder area and the epigastrium. 50 mg. nicotinic acid intravenously removed half the pain over the gallbladder area only, but not from the epigastrium. After half an hour, therefore, 100 mg. more of the drug was injected intravenously and this had the desired effect of producing cent per cent removal of pain in another 20 minutes.

3. Appendicitis

(a) Bunda, aged 21, H.M., relapsing appendicitis, came with severe colicky and nauseating pain with slight fever, 24 hours' duration. 100

mg. nicotinic acid intravenously lulled the patient to sleep though on waking slight pain was persistent for which another injection was made which removed all traces of pain.

(b) C. R., aged 25, H.M., clinically relapsing appendicitis. When seen, he had nausea, frequency of stools and tenesmus with slight vomiting, etc. One injection intravenously pro-

duced 33 per cent relief.

(c) Prithi Chand, aged 48, H.M., was clinically considered to be suffering from sub-acute cholecystitis with perhaps appendicitis (uric acid crystals in urine). Pain was excruciating. 100 mg. nicotinic acid intravenously relieved 75 per cent of pain and with another injection by the same route the rest of it too ceased, but tenderness over McBurney's point remained. Although the patient was looking cheerful, he appeared to emaciate gradually. Consequently he was admitted for skiagraphy. Further investigation revealed it to be a case of lymphosarcoma of the intestine with metastasis in the neck proving fatal in about two months' time. The drug thus appears to relieve pain of malignant growth also.

4. Supra-orbital, sciatic, brachial and testicular neuralgias

Of the five cases of supra-orbital neuralgia, the pain of one was completely abolished with one injection of 50 mg. nicotinic acid intramuscularly. Two cases got 50 per cent relief of pain with one injection of each of 50 mg. intravenously. The fourth case was probably malarial in origin and had influenzal frontal sinusitis. He derived considerable relief of pain with one injection of 100 mg. intravenously. Had to be given quinine for complete cure.

D. K., aged 30, S.F., relapsing supra-orbital neuralgia of four years' duration, came in tears, due to intense pain for three days. 100 mg. nicotinic acid intravenously alleviated her suffering by 40 per cent in 20 minutes' time after which she got a shivering attack with fever lasting for three hours and aggravation of pain.

Soon both the fever and pain subsided.

M. F., aged 38, right sciatica of three days' duration. 100 mg. intravenously relieved half

the pain there and then.

M. F., aged 68, was seen screaming with pain along the sciatic nerve, two days' duration. 50 mg. nicotinic acid intravenously did not produce any effect upon the pain and she had consequently to be treated by other methods as she was getting much depressed.

F. B., aged 45, M.F., brachial neuralgia of a few days' duration was completely cured in three days' time by daily intravenously injec-

tion of 50 mg. nicotinic acid.

N. N., aged 65, M.F., was clinically diagnosed as a case of cervical meningo-myelitis, pain extremely severe and radiating from the side of the upper dorsal spine along the arm to the fingers. Was given 50 mg. nicotinic acid intravenously daily for one week and the pain gradually subsided. Got 25 per cent relief of pain on the first day alone.

S. B., aged 25, H.M., had neuralgia of the right testicle of 8 days' duration. No cause was apparent. 100 mg. intramuscularly of nicotinic acid effected 75 per cent relief of pain.

5. Raynaud's disease

N. G., aged 45, M.F., a typical case of this disease of a few days' duration, had gone only to the stage of local asphyxia or congestion, was cured within eight days with intravenous nicotinic acid (50 mg. on alternate days). She was also prescribed ichthyol and hot baths for her hands (during the last three or four days' treatment).

6. Miscellaneous.

Mam Chand, a case of malaria with influenzal headache, acute sinusitis and bronchitis. The fever was reduced with 10 grains of quinine intramuscularly but the headache did not yield to ordinary analgesic remedies. 50 mg. intravenously nicotinic acid relieved the pain altogether, but it recurred after four hours. The patient could not be traced thereafter.

H. R., aged 20, H.M., was probably a case of pleurisy of eight days' duration. He had severe pain on the right side of his chest with cough and dyspnæa and some friction sounds over the right mammary and infra-mammary regions. Cough and pain prevented sleep at night. One 50 mg. intravenously of nicotinic acid not only relieved the pain by 75 per cent but the breathing became easy and the patient slept well.

Jagira, aged 25, H.M., acute catarrhal jaundice of four days' duration, had nausea and was vomiting with severe pain over the right hypochondriac and epigastric regions, apparently in great agony and seemed exhausted due to pain and vomiting, etc. 50 mg. intravenously nicotinic acid produced 25 per cent relief of pain there and then, and the rest was abolished by other medication.

N. Lal, aged 40, H.M., a case of chronic rhinitis, was going to get an acute relapse of his trouble when he was prescribed 150 mg. nicotinic acid by mouth and this had the desired effect

of warding of the attack.

It will be seen that the gallbladder and appendicitic pain is less amenable to this therapy than the renal and neuralgic pains. It also failed altogether in a case of sciatica, although this might have been benefited by a higher dose, to which the patient did not submit.

It is an analgesic drug, abolishing pain quite quickly, generally temporarily and sometimes

for ever.

Although the number of cases is too small to enable one to proclaim the supremacy of the drug over all the other hitherto known therapeutic agents, this work opens a new field for further trial in symptomatic treatment of pain.

My thanks are due to Colonel P. A. Dargan for his kind permission to publish this article and adding some notes to improve it.

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Indian Medical Gazette

JUNE

THE cc., c.cm, MIL., mil., AND ml.

Historical.—The urge to adopt a natural length as a fundamental unit of measurement was felt as early as the 17th century. The astronomer Jean Picard (1620–1682) proposed to take as a unit the length of a pendulum beating 1 second at sea level at a latitude of 45°. Nearly a century later the National Assembly of France, in 1790, appointed a committee to consider the relative merits of: (i) the pendulum, (ii) a fraction of the length of the equator, and (iii) a fraction of the terrestrial meridian. The last measure was favoured and a commission appointed to measure the meridian between Dunkirk and Montjuich near Barcelona (Sears, 1938).

The 'end standard' metre (metre des archives).—In 1799 a commission of the representatives of different countries, convened by the French Government, chose the length of the arc of the polar quadrant which passed through Paris as a natural length. 1/10,000,000 of it they called the METRE. This was a natural invariable measure. A bar of platinum measuring exactly a metre was made and called the 'metre des archives'. It was an 'end standard' representing the length from end to end.

As a matter of fact the length of the arc was not measured absolutely accurately. The length of the bar is less than what it was intended to be by about 1/8,000th of itself (Pendlebury, 1939). The bar, however, was not altered.

The metre was divided decimally into decimetres, centimetres and millimetres.

The measure of volume was a cubic decimetre and called a LITRE. One litre = 1 decimetre \times 1 decimetre = 1 cubic decimetre = 1,000 cubic centimetres = 1,000 cc's = 1,000 cc. ('s may be dropped).

The measure of mass was also derived from a cubic decimetre. It was the mass (weight for all practical purposes) of a litre of distilled water of maximum density (i.e. at 4°C.) and called a KILOGRAMME. A cylindrical piece of platinum of this mass (the weight) was made, kept as a standard and called 'kilogramme des archives'. It was divided decimally into decagrammes, grammes, decigrammes, centigrammes and milligrammes.

The 'line standard' metre (prototype metre).—In 1875 there came into being the Convention des metre and later Bureau International des Poids et Mesures. It was felt that

the original 'end standard' should be replaced by a 'line standard', because the latter could now be made more accurately than the former. On a bar of iridium-platinum (10 per cent Ir. and 90 per cent Pt.) two lines were ruled to mark as nearly as possible the length of the metre des archives. The new measure was called the PROTOTYPE METRE.

The prototype kilo.—The kilogramme des archives was also changed. The new weight, called the PROTOTYPE KILOGRAMME, was a cylinder of the same iridium-platinum alloy as was used in the bar of the prototype metre and had a mass as nearly as possible of the kilogramme des archives. It was no longer derived from the litre.

The litre redefined.—In 1902 the litre was redefined as the volume of the mass of one kilogramme distilled water at 4°C. Thus instead of the kilogramme being derived from a litre, a litre was derived from a kilogramme. 1/1,000 litre is now a MILLILITRE (MIL., Ml. or ml.), not a cubic centimetre (cc.).

In changing things round in this way the post-1902 litre has been found to be slightly larger than the pre-1902 litre. The ml. is therefore slightly larger than a cc.

1 ml. = 1.00028 cc. (General Medical Council, 1932).

On this obviously insignificant difference too there is a difference of opinion. According to some workers,

1 ml. = 1.00027 cc. (Hamill, 1947).

Perhaps it is not quite so 'sad to reflect that, although nearly half a century has passed since the litre was redefined, many people, including regrettably a significant proportion of the medical profession, continue incorrectly to use the cubic centimetre as an alternative to millilitre' (Hamill, loc. cit.).

A medical lexicographer from the other side of the Atlantic says:

'mil. The thousandth part of a litre, a cubic centimetre; this word was used in the U.S. IX* and the N.F. IV† in place of cubic centimetre, but has been dropped in the U.S. X and N.F. V' (Stedman, 1933).

The author of a recent encyclopædic book on medicine, however, says:

'Prescription writing has been simplified by the action of the Council on Pharmacy of the American Medical Association which has decided against perpetuation of the apothecary system. The metric system is now official for the United States Pharmacopæia and publications of the American Medical Association' (Hyman, 1947).

^{*}United States Pharmacopæia, 9th edition. † National Formulary (U.S.A.), 4th edition.

In the metric-apothecary equivalents, however, cc., not ml., is the equivalent of millimetre as given by the author.

Nearly all syringes and most pipettes are marked in cc.'s.

'c.cm.' is only a longer way of writing cc. We prefer cc. 'c.c.' (with a full stop after the first c) is not necessary. Further, it appears to be an abbreviation for 'chief complaint'.

MIL., mil. and ml. denote a millilitre. We prefer ml., if cc. is not used.

Metric system, and the gramme, cc. and ml.— It has been stated that the weights and measures can no longer be correctly described as metric inasmuch as the kilo and the litre have been legalized as weight and volume of a cylinder specially preserved (Hamill, loc. cit.). The prototype kilo, however, being 'as nearly as possible' equal to the kilogramme des archives, must be as nearly metric as it is possible to be. It is, therefore, metric and will remain so. The rest follows. The ml. must be metric and the cc. of course is metric, being derived from the metre itself.

Metric equivalents.—Eminent British men of science have recently stressed the need of 'giving the metric equivalent of data expressed in British units' (Robinson, Dale, Appleton, Darwin and Paterson, 1947). The position is particularly difficult with respect to ml. and/or cc. as the equivalents from the following sources show:-

Medical 1 cc. = 16.68911 minims General Council (loc. cit.)

Stedman (loc. cit.):

= 16.23412 minims Apothe- 1 cc. Imperial caries' measure.

U.S. Apothecaries' 1 cc. =16 minims measure.

Dorland (1947) 1 cc. =16 minims 1 fluid ounce = 30 cc.

=16 minims Hyman (loc. cit.) .. 1 cc. = 16 minims Tuberculin syringes 1 cc.

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BETWEEN OURSELVES ON PREPAR-ING A TYPESCRIPT, ETC.

THE paper economy has again become necessary. Your article, however, must be typed: (i) with a generous margin, (ii) in double space, and (iii) on one side of a sheet only. Not to do so is false economy as far as the ultimate expenditure of paper goes. Alterations made in editing on a sheet with narrow margin, typed in single space and/or on both sides of a sheet are not made out by the printer. They are undertaken again on the galley proof. Another galley proof may be required. Thus the paper is expended just the same with extra labour and irritation in dealing with the proof. The publication of the journal is also delayed.

As long as the need for the economy lasts we will not insist on two copies of the typescript for our office, as long as you retain a copy which we may require. A typescript is hardly ever mislaid in our office. Occasionally, it is mislaid by the referee or in the press, or is lost in transit to and from them. Even these accidents are few and far between unless communal frenzy or labour excitement disturbs the routine of the town.

If for some reason or other single space typing is inescapable, the following conditions must be satisfied: (i) the margin should not be less than 1/4 of the width of the page; (ii) after the final reading the typescript should be locked up in your drawer for two weeks to enable you to forget the syntax; (iii) it should then be read to you by someone other than your typist; (iv) all errors now detected should be corrected by pasting typed slips; and (v) typing on both sides of the sheet should be avoided.

If for some reason or other typing on both sides is inescapable at present, then kindly hold back your contribution as long as the economy lasts.

Under skiagrams and photographs should be pasted type-written slips giving the legend. R and L if wrongly placed on the former should be stated to be so placed in the slip. Lately, several errors have occurred due to inversion and lateral inversion of the skiagrams.

The writing on figures and graphs should not be typed, such writing is not easy to photograph, in preparing the block.

We are mending our ways also. Due to economy in paper we have not been acknowledging receipt of typescripts promptly and have been informing the contributors of the decision of the editorial committee only, later. This has caused annoyance and we express our regrets. From now onwards two intimations will be sent as formerly: one on receipt and one on deciding on publication.

Reports and Notifications from the Medical Councils in India

MEDICAL COUNCIL, UNITED PROVINCES

MINUTES of the Meeting of United Provinces Medical Council held at Lucknow on Friday, 19th March, 1948.

PRESENT

President

Dr. A. C. Banerjea, M.B., B.S., Dr.P.H.

Members

Dr. Mohammad Abdul Hameed, M.D., M.R.C.P. Dr. Rameshwar Singh, L.M.S. Dr. Prem Shankar Verma, L.M.P., P.S.M.S. Dr. Chaudhri Hardeo Singh Verma, L.M.P.

Dr. B. B. Bhatia, M.D., M.R.C.P. Dr. S. P. Gupta, M.D., B.S.

Registrar-Secretary

Dr. R. N. Shukla, M.B., B.S.

1. The following resolution, moved from the Chair,

1. The following resolution, moved from the Chair, was passed all standing:

'This Council places on record its deep sense of sorrow on the dastardly assassination of Mahatma Gandhi, the Father of the Indian Nation and the maker of bloodless revolution, and conveys its heartfelt condolence and sympathy to the bereaved family.'

2. The minutes of the last meeting were confirmed.

3. The case against Dr. Pran Nath Seth, M.B., B.S., page postpoped for further investigation.

was postponed for further investigation.

4. Resolved that the District Compounders' Association, Lucknow, be informed that the practice of writing prescriptions in code words and signs was not permitted by this Council and if concrete cases are reported due notice would be taken.

5. The recommendations of the Standing Committee, which met on 18th March, 1948, were accepted

with slight modification.

6. Resolved that the President may send a reminder to Government for expediting consideration of amendment of the United Provinces Medical Act.

7. Resolved that the Government should be approached with the request that no medical practitioner be nominated or elected to any Government body, committee, registered and recognized society or association dealing with medical and health matters unless and until he is registered under the Provincial or Central Medical Act.

The Council also resolved that the Indian Medical Association be requested to revise their rules so that medical practitioners whose names have been deregistered may not remain members of, or join, the Asso-

ciation.

Further, it was decided that the Government should be requested not to grant financial aid to such societies with which deregistered medical practitioners are associated.

8 and 9. [Withdrawn.]

10. Resolved that the request of the District Compercentage of admissions to the Medical Colleges and the Compounders Training Classes does not come within the purview of this Council.

> A. C. BANERJEA. President, Medical Council. United Provinces.

R. N. SHUKLA, Registrar. 31-3-1948.

Medical News

PATENT INDIAN MEDICINES

(Abstracted from the Journal of the Indian Medical Association, Vol. 17, October 1947, p. 22)

PATENT or proprietary medicines in the Indian Union will have to be registered, as directed by the Drugs Control Order, with the Central Drugs Laboratory, Government of India, 110, Chittaranjan Avenue, Calcutta.

In course of a circular issued from the Central Drugs Laboratory it is pointed out that under the Drugs Act, 1940, and the Rules made thereunder all patent or proprietary medicines with undisclosed formula (i.e. where a full list of all the potent or poisonous ingredients of a medicine with the exact quantities of each is not printed on the label or container of the medicine) must be registered at the Central Drugs Laboratory.

This order, however, does not affect the medicines or substances conclusively used or prepared for use in accordance with the formulæ of the indigenous systems of medicine, as also patent or proprietary medicines intended to be used solely for veterinary purposes subject to this condition that the description of such

medicine is given on the label or container.

It is only on the receipt of the Certificate of Registration from the Director of the Laboratory to the particular medicine submitted to him that it can be marketed. The Director of the Laboratory is authorized to reject any application for registration if the formula stated by the manufacturer does not conform to the results of the test.

INTERNATIONAL STUDENTS' CLINICAL CONGRESS

By VICTOR GORDON

(Reproduced from Circular No. F.814 issued by British Information Services, Eastern Home, Mansingh Road,

MEDICAL students from more than 30 countries will meet in Britain in July for the first International Students' Clinical Congress.

It will be a noteworthy occasion, as it will be the first such congress in the world to be organized by students for students and recently qualified medical practitioners. The idea for such a conference was put practitioners. The idea for such a conference was put forward at the International Union of Students' Conference in Prague three years ago. It was taken up by the British Medical Students' Association who are organizing this inaugural function.

The 200 delegates will include men and women from India (from whom a delegation of 15 is expected), Burma, the United States, Australia, Africa, Canada and South America. It will be truly an international rathering.

gathering.

On 'Tour'

The Congress is being held in London, Birmingham and Oxford under the presidency of Professor J. A. Ryle, Professor of Social Medicine, University of Oxford. As the Congress will move successively from place to place there will be no need for the individual members to make a choice as to those things which may be of the most interest—the whole Congress will

Activities of the Congress will include ward teaching, lectures, films of medical interest, demonstrations, visits to research laboratories and other academic work. Visits to industrial laboratories engaged in work and research of medical interest are also included. On a less professional note there will be visits to the theatres

Table III
Relation with duration of pregnancy

Weeks of pregnancy	28–31	32–35	36–40
Central Marginal Lateral Total Percentage	4	3	6
	3	4	7
	1	3	9
	8	10	22
	20	25	55

Table IV
Relation to gravidity

Gravidity Number of cases	1 7	2 8	3 2	4 5	5	6	7 4	8	9	10	11	12 2	
Central	1	4	0	1	3	3	Ō	Õ	Õ	Ď	-	0	ī
Marginal	1	3	1	3	2	1	2	0	0	0	0	2	ō
Lateral	5	1	1	1	1	0	2	1	0	0	0	0	0

Table V
Relation with age

Age in years	16-20	21–25	26–30	31–35	36-40
Central	0	2	6	5	0
Marginal	3	3	5	1	1
Lateral	5	3	3	2	0

There is a proportionately greater incidence of the complete variety within 28 to 31 weeks of pregnancy and more in the age period 26 to 35 years. It conforms to Penrose's (1939) conclusion but the relationship with parity is not very definite.

Treatment

Resuscitation.—Only 20 per cent of cases received blood transfusions and the majority were treated with gum saline or glucose saline infusions. In 30 per cent of cases the hæmoglobin was below 60 per cent (Hellige) and the patients required blood transfusions.

Methods used.—Two cases of marginal placenta prævia were treated expectantly followed by section at 38th and 39th week respectively necessitated by recurrent hæmorrhage. They came to the hospital at 32nd and 35th week respectively. Both were elderly primiparas with one bleeding outside. Others required immediate treatment. Methods employed with corresponding results are tabulated in tables VI and VII.

A patient died without any operative treatment. She arrived in extreme shock and collapsed on arrival in spite of treatment. The placenta was retained in 2 patients, and one of them died.

Analysis of results

Five maternal deaths were recorded.

1. A 12th gravida, 2 bleeding, last induced by a vaginal examination outside and brought

TABLE VI
Methods of treatment and results

Made of treatment	ş	Number of	RESULTS T	O MOTHER	Resours to Child			
Methods of treatment	,	cases	Living	Dead	Stillbirth	Neonatal death	Living	
Willet's forceps Expectant plus section Cæsarean section Version plus leg traction Breech and leg traction Rupture of membranes Forceps No interference		8 2 11 6 4 6 1	6 2 10 6 3 6 1	2 0 1 0 1 0 0 0	4 0 2 6 3 3 0	2 0 6 0 1 2 0 1	2 2 3 0 0 1 1 0	
TOTAL	•••	39	35	4	18	12	9	

Results.—Maternal mortality

12.5 per cent (5 cases)

Maternal morbidity
Average duration of morbid period
Festal mortality

20.0 per cent (8 cases) 10.64 days 77.5 per cent

Table VII

Treatment according to type of placenta prævia

	Treatment according to type of pulsaked provide					·		
448g	(A.R.M	A.R.M Willet	Section	Version	Breech	Nil	Forcep
Central Marginal Lateral	• •	0 2 3	0 6 2	12 2 0	0 3 3	1 1 2	0 0 1	0 0 1

to the hospital with vagina packed. She died Marginal placenta prævia of shock. treated for shock only.

2. A case died after Cæsarean section on a

'poor' condition.

3. Two cases died of hæmorrhage and shock (one after manual removal of the placenta).

4. A case died of sepsis and secondary

hæmorrhage.

All of these belonged to the group C

Of 8 morbid cases, two were due to B. coli pyelitis, the remainder due to puerperal sepsis (5 among groups B and C). Maternal mortality and morbidity in the series were more than three times commoner among emergency than booked cases (table VIII).

TABLE VIII

		Booked cases	Emergency cases
Number Mortality and morbidity	••	7 3	33 10

Fætal mortality.—Thirty stillbirth and neonatal deaths (tabulated against birth weight in pounds in table IX).

Table IX Fætal deaths against birth weight

Pounds	1–2	2-3	3–4	4–5	5-6	6–7	7-8
S.B. N.N.A. G.I.I.	1 1 0	4 2 1	2 4 1	5 3 0	1 2 0	1 0 0	2 0 0
TOTAL	2	7	7	8	3	1	2

S.B.=Stillbirth. N.N.A.=Neonatal asphyxia. G.I.I. = Gastro-intestinal infection.

Remarks.—As the average weight of a viable baby in Bengal is near about 5 pounds, it would appear that nearly 80 per cent of babies died directly or indirectly from pre- or immaturity. The deaths of the viable feetuses were mostly due to premature separation of the placenta. It will be evident from table IX that the stillbirth rate is proportionately commoner in these babies. It can be assumed that the big babies cannot stand placental separation as well as the smaller ones. The cause is possibly in their greater metabolic needs and co-existent deficiency of placental reserve near term. On the other hand premature babies die more of neonatal asphyxia and gastro-intestinal infection.

Discussion

Compared with the British, American and Continental figures (vide table X) our results are poor indeed. This, however, may be explained in the background of the local conditions, viz:

(1) Lower vitality of the patient from malnutrition, disease and overwork. They are already too anæmic due to other causes and do not stand bleeding well.

(2) Delay in diagnosis and treatment due to lack of competent medical help, lack of hospitals, lack of convenience, social bias and negligence.

(3) Inadequate facilities for treatment, e.g. blood transfusion and Cæsarean section are almost impossible in many parts of the country and even in hospitals they are limited.

(4) Inadequate facilities for the care of pre-

and immature babies.

(5) Septic organisms grow more readily in the warm, moist climate of the country.

Suggestions for improvement

Both feetal and maternal results can be improved by eliminating the following factors,

TABLE X duthous and Mathada

Author	Year	Method used	Maternal mortality percentage	Fœtal mortality percentage
Stratz (173) Daily (139) Barkeley (4,580) Hendry and Baird (258) Browne (3,103) Morgan (130) King and Chun (134) Macafee (176)	1934 1936 1937 1939 1944 1945	Version 'Composite' (49% section). 'Composite' 'Composite' (64% section). 'Composite' Do. Do. 'Composite' (expectant plus section).	0.6 0.0 7.0 2.7 5.9 0.0 0.75 0.57	44.0 32.5 59.0 53.0 54.0 14.0* 54.0 19.0†

^{*} Excluding premature babies.

[†] Among sectioned cases feetal mortality is 2.9 per cent.

N.B.-In the recent series blood transfusion has been widely used.

(1) Proper antenatal care

This will help by improving patient's general condition so that she is better equipped to stand bleeding.

This will lead to early diagnosis and early treatment as the patient will be conscious enough to call for help with the slightest amount of bleeding.

This gives a chance so that her blood may be grouped and Rh factor determined as a routine measure in an antenatal clinic. Thus much time may be saved when she will actually need blood as an emergency therapy.

Efficiency of antenatal care is much stressed by Munro Kerr in the recent years. The success of antenatal care rests on the proper realization of its importance by the general masses and also on their standard of living.

(2) Proper training of general practitioner and nurses

There is a need for a greater realization by the general practitioners and nurses of the seriousness of all antepartum hæmorrhage and their part in the treatment of the condition. Their part is only to resuscitate and hospitalize the patient early, without any vaginal interference. They must realize that home in general is not the suitable place for the treatment of this condition and mortality is much higher in the domiciliary than in hospital practice (Browne, 1946). The patient must be removed to the hospital with the first 'warning hæmorrhage' and whether one should wait for one or more recurrences of bleeding before embarking on treatment will be decided when the patient is safe in a suitable hospital.

(3) Increased facility for blood transfusion

It is one of the most important addition in the treatment of placenta prævia which is responsible for the improved results of the modern Bill (1927) reduced the maternal mortality from 11 per cent to 1.8 per cent largely by routine blood transfusions before delivery to all patients with red blood cell count of 3 millions or lower per c.mm. Moreover, by its introduction Cæsarean section can be performed with more impunity and less danger with much improved maternal and fœtal results (Macafee, 1945; Morgan, 1944; Daily, 1934; Hendry-1937 series). In its absence intravenous gum saline and subcutaneous saline are probably the only alternative, but there cannot be any question of the value of replacement of blood lost by blood. By this means shocked and collapsed patients can be made to stand treatment. To obviate the danger of incompatibility inherent in blood transfusion, proper grouping, matching and Rh factor determination of blood should be done with care. The best place to do it is antenatal clinic.

(4) Vaginal examination and packing at home

These should be strictly avoided. An examination may start a bleeding which may be severe enough to demand immediate treatment or may even kill the patient. Moreover, both of the above practices are fraught with the danger of sepsis. By vaginal examination alone maternal mortality from sepsis may be raised from nil to 2 per cent (Schweitzer-Browne, 1946). Against vaginal packing, Browne (1935), Davis (1935), and Kellog (1933) have given their verdict. As generally practised it is associated with high percentage of maternal morbidity (91 per cent, Browne) and about 6 per cent mortality due to sepsis (Schweitzer-Browne, 1946). Again however well applied, it cannot possibly stop hæmorrhage by any mechanical means but may do so by producing shock. It requires skill and favourable surroundings and should never be taken as an easy procedure. Browne (1946) observes, and very rightly, that efficient packing is very rarely seen. First hæmorrhage in placenta prævia rarely kills and therefore if the rule of hospitalization with the first bleeding is followed rigidly, there will be few occasion to pack the vagina.

(5) An unit for the care of underweight babies

This should be organized. With placenta prævia there is greater frequency of premature delivery (40 to 50 per cent, Browne), greater frequency of twins (Strassman, Seely, 1945, Essen-Moller, Irving) and the babies are relatively underweight for their length (Strassman). Therefore, the incidence of babies below the viable birth weight is very high and form the chief cause of fœtal mortality. This is again responsible for neonatal infections which further reduces fætal salvage. Only the help of a pædiatrician and adequate arrangements for the care of pre- and immature babies can reduce the neonatal death rate. Establishment of a breastmilk bank will be of great help in this respect.

Management: (1) When should a vaginal examination be done?

This for diagnosis alone should be condemned. It should be done only at the time when the treatment is called for, i.e. when the bleeding is considerable. Unnecessary haphazard examination when there is little or no bleeding may separate the placenta, start a bleeding and precipitate active treatment with termination of pregnancy. This is particularly injurious for the fœtus whose chance to survive increases as pregnancy nears term. Every week helps the growing fœtus and benefit is maximum when viable age and weight are reached. However, to eliminate cervical pathology speculum examination can be done.

(2) What should be done in a case with no bleeding?

Provided the condition of the patient and fœtus is satisfactory, particularly if the fœtus has not gained the viable age and weight as judged per abdomen, these cases should be treated expectantly in a hospital. Macafee (1945), who adopted this line of treatment even in patients who had several small hæmorrhages, observed that the gain in weight by the fœtus is associated with much lower feetal mortality.

TABLE XI Relationship of fætal weight to mortality

Average	Mortality,		
weight	per cent		
5 lb. 2 oz.	47		
6 lb. 12 oz.	6		

As there was almost no mortality in his series there is much reason to say that in carrying out the expectant treatment in proper surroundings the risk of the mother is very little. Best result is obtained if Cæsarean section follows expectant treatment at or near term. The patient during this treatment should be in absolute rest and kept ready for immediate section if required. The treatment is invalid when the labour has started.

Active treatment: (1) Choice of treatment

It should depend on the individual case but the guiding principle should be to choose one which is most gentle, easiest, surest, quickest and preferably without any harm to the fœtus. To enable the patient to stand the active treatment, proper resuscitation measures should be carried out.

(2) Vaginal vs. abdominal methods

There is no doubt at the present moment that Cæsarean section in ideal conditions holds the best prognosis for both mother and fœtus. Arnell and Guerriero (1940) published a report where the vaginal methods of treatment show a maternal mortality five times greater than by Cæsarean section. Siegel (1934) states, 'The maternal mortality has been reduced from 8.57 per cent by the vaginal methods to 1.72 per cent by Casarean section in 1931 to 1.0 per cent in 1934'. His feetal mortality was 48.8 per cent in vaginal and 27.8 per cent in abdominal methods. Wilson's (1934) figures are also interesting. Of 102 cases, 70 treated by obstetric methods with 2 deaths (2.8 per cent) and 32 treated by classical section with no death. Macafee by adding expectant treatment to section reduced fætal mortality to 2.9 per cent. On the other hand best results from obstetric methods are

those of (Stratz-Browne, 1946). His maternal mortality was 0.6 per cent but feetal mortality was 44 per cent. This high fætal mortality tells against vaginal methods if a live child is wanted. Although maternal mortality is similar in both cases (Macafee, 1945; Stratz-Browne, 1946), it must be made clear that the section is usually selected for grave cases where vaginal method is impossible. (Kerr, 1933, 1937) states that greater exhibition of Cæsarean section particularly in central and marginal placenta prævia gives better prospect for both mother and fœtus. This from one, who is strongly against 'promiscuous employment of Cæsarean section', is worthy of careful notice.

To determine treatment, a careful and gentle vaginal examination should be made under anæsthesia with stringent precaution against infection in an operation theatre where everything is ready for Casarean section. The patient must be ready for coliotomy with blood ready at hand for transfusion. The condition of fœtus is of paramount importance in the final decision on treatment. If the patient is in labour, its stage and the history of previous labour, if any (specially its duration), should be taken into consideration. Treatment not only depends on the amount of blood already lost but also on the amount she is likely to lose if slower

methods are employed.

(3) Casarean section

Maternal mortality is 0 to 6.4 per cent. Feetal mortality is 10.5 to 24.5 per cent. The indications for the operation-should be broadly mentioned.

Maternal.-When the vaginal operations are either risky or impossible, e.g. central type and undilated cervix where labour is going to be long with a correspondingly dangerous first stage, stillbirth rate is more in slower methods.

Fætal.—Viable fœtus showing signs of distress sometimes even with slight bleeding, e.g. when the cord is inserted at the lower separated pole of the placenta (Macafee, 1945).

Fœtus near viability, as it cannot stand the

strain of slower vaginal process.

A collapsed patient, however, should not be treated by section because they invariably die. Type of operation will depend on the case.

If rapidity is required-classical, but if there is chance of sepsis-lower uterine segment.

Anæsthesia.—It should be least asphyxiating to the baby. Induction should be quick but smooth and its duration short. Combined nitrous oxide gas, oxygen and ether is quite suitable. 5 per cent cyclopropane with 95 per cent oxygen is ideal. Local anæsthesia does not give sufficient relaxation and thus quick operation which is often needed is difficult.

(4) Version vs. Willet's forceps

Scalp traction with Willet's (1925) forceps should be preferred to version and leg traction. Although both compress the placenta to control hæmorrhage, fætal mortality is substantially lower in scalp traction because a breech delivery is thereby avoided. It is simpler, 'gentler' and of wider application (as the majority of fœtus present by vertex). It needs only one finger dilatation of cervix, an opening which does not allow a foot to be brought down. It requires less internal manipulation and therefore the chance of further hæmorrhage and sepsis is less. It can be applied even without anæsthesia which is an advantage in these cases. Indicated in marginal placenta prævia where subsequent labour is likely to be short. Otherwise prolonged compression may kill the fœtus. It appears to be an ideal instrument to be applied during transportation to a hospital and Cæsarean section may be safely carried out after this. In this again its supremacy over version and leg traction as first aid treatment is clear.

Browne (1946) denounced Willet's (1925) forceps mainly because of his two cases who died of Cl. welchii infection. Similar incidence has never been reported in India where this method is widely practised. Moreover, in both of Browne's cases the labour was prolonged. These cases should not be treated with scalp traction. It must be emphasized that both dead fœtus and prolonged labour contraindicate the use of this forceps.

External version and leg traction should be reserved for premature and small babies where version is easy and less likely to cause injury to the mother. The prospect of feetal life being less the interest of the mother is of first concern.

TABLE XII Results

	Maternal mortality, per cent	Fœtal mortality, per cent
Scalp traction with Willet's forceps. Version and leg traction	3.5 7.0	46.4 ,

In both methods once the bleeding has been stopped hurried extraction should be avoided. Stratly (Browne, 1946) has cautioned against it because it may lead to rupture of the uterus and shock. According to Winter and Halban the maternal mortality is 6.9 per cent for slow delivery as compared to 13 per cent with hurried extraction. Feetal mortality is however less by about 25 per cent. But the danger is too great for the mother for its general adoption.

(5) How much weight traction should be given?

Too much weight traction helps rapid extraction which should be avoided. Lacey advocates $1\frac{1}{2}$ lb. weight. It is better to use weights between 1 to 1½ lb.

(6) Third stage of labour specially important

Slightest bleeding at this stage may kill the patient. In case of retained placenta it is unwise to persist with Credé's method for expressing the placenta. It is shocking and particularly so for the exsanguinated patients. manual removal of the placenta appears to be safer procedure than repeated unsuccessful Credé's. It must be done very gently with strict precaution against sepsis. Proper resuscitation measures should be taken along with this.

(7) Prophylactic chemotherapy

This precaution will guard the patient against sepsis which forms the second most common cause of maternal mortality. 6 gm. of soluble sulphapyridine should be given intravenously with saline followed by sulphathiazole 1 gm. t.d.s. orally for 3 to 4 days subsequently.

Conclusion

Modern improvements in the treatment of placenta prævia have considerably reduced both maternal and feetal mortality. The results for the mother have almost reached per-Macafec reached the best fœtal results so far obtained (19 per cent). Browne observes that there is a limit to the success in improvement of feetal results, the reasons being:

(1) Associated malformations like anencephaly and spina bifida probably from the abnormal situation of the placenta (2.5 to 2.7 per cent. Greenhill, 1939; 3.4 per cent, Macafee, 1945)

(2) Occasional association with erythroblastosis fœtalis (bigger placenta encroaching on the lower uterine segment).

(3) Inevitable prematurity in some cases, possibly nature's way to eliminate the abnormally situated ovum.

(4) Insertion of the cord at the extreme lower pole of the placenta.

Browne fixes the limit of best success to be near about 25 per cent on the average.

Finally, the crux of the whole matter depends on the social and economic status of the average Indian women. This must be improved before other means can be fully effective in their application.

I am grateful to Prof. M. N. Sarkar for his kind permission to review the abovementioned cases of Eden Hospital, Calcutta.

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INDIGENOUS KALA-AZAR IN THE PUNJAB

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This province falls outside the so far described endemic limits of kala-azar. In the last three years we have come across four cases of kala-azar, two of which were imported cases, and of the other two, one got the infection at Mussoorie and the other at Lahore. Reports of these two cases are summarized below:—

Case 1.—B. N. G., Hindu male, aged 33 years, born and brought up in Lahore, had not been out of Lahore in the past seven years, was admitted to Sir Ganga Ram Hospital on 2nd October, 1944, with continuous pyrexia of nearly four months' duration. The pyrexia had started gradually since the last week of May

and for the first two weeks or so the patient had been attending his office daily, till the range of temperature became high between 100 to 103°F. There was no toxemia, no wasting and only slight anamia. There was no splenic or hepatic enlargement at this stage and no other localizing signs in the abdomen, chest or any other part of the body. Routine laboratory examinations including the Widal, blood culture Radiological and W.R. were all negative. examination of the chest showed no pathology in the lungs. Mild pyorrhea alveolaris was present and the septic feeth were pulled out with no relief. A few slightly enlarged lymph nodes were palpable in the neck and one of them was sent for biopsy. The pathologist reported 'an old healed tuberculous gland. It was in the last two weeks of his illness that the patient started losing weight, grew cachectic, marked anæmia developed and both the liver and spleen became palpable, a couple of fingers' breadth below the costal margin, exhibiting fairly firm edges. Examination of the blood at this stage showed a secondary anæmia with a total W.B.C. count of 3,000 per c.mm. This picture aroused the suspicion of kala-azar and serum test for kala-azar was done. Both the aldehyde test and urea stibamine test were highly positive.

Splenic and sternal puncture both revealed extra-cellular and intra-cellular L.D. bodies. The patient was immediately put on urea stibamine treatment but his condition had much deteriorated and he ultimately died. Post

mortem was not permitted.

Case 2.—Mrs. M. R., aged 27 years, wife of a contractor and mother of seven children, the youngest being three months old. The family spends the winter months at Lahore and summer months (from April to October) at Mussoorie, and this routine has been adhered to for the last 12 years. Last year (1946) as usual the family went to Mussoorie from Lahore in March. The journey was performed by direct route and no other place was visited on the way or during the stay at Mussoorie. While at Mussoorie she was delivered on the 19th November. The delivery was at full-term and labour was normal. She started intermittent pyrexia after the delivery and grew pale and weaker. Routine investigations were carried out by the attending physicians and a blood report, dated 8th December, 1946, showed Hb. 46 per cent, total R.B.C. count 3.4 million, total W.B.C. count 6,875 per c.mm.—differential count, polys. 42 per cent, lymphos. 58 per cent-and no malarial parasite. Urine showed a trace of albumin and no other abnormality. X-ray of the chest was clear. On 14th December, 1946, the serum aldehyde test was done for the first time and showed a faintly positive result. Urea stibamine was started on 16th December, 1946, and a total dose of 8 grammes given in 10 injections. On 22nd December, 1946, the total W.B.C. count was 3,750 per c.mm. with 67 per cent lymphocytes. After this inadequate course of

urea stibamine, no response was noticed. blood examination done on 13th January, 1947, showed Hb. 44 per cent, R.B.C. 3.28, W.B.C. 3,125 per c.mm. with 68 per cent lymphos. B.T. rings were detected. Quinacrine was given by mouth on 13th, 14th and 15th January with no response. She was then shifted to Lahore. On arrival here the patient was markedly anæmic, moderately wasted, showed slight pigmentation of the feet, very slight toxemia, the temperature ranging between 100°F. in the morning and 102°F. in the evening. The spleen was palpable 6 fingers below the costal margin and liver 4 fingers. Both were fairly firm to feel. Except a functional bruit in the pulmonary area. the heart and lungs were clear. Sternal puncture was done and found negative but the splenic puncture revealed the presence of L.D. bodies. The patient was immediately put on course of aromatic diamidines. Stilbamidine was employed. An initial dose of 0.025 gm. was followed by daily injections of 0.05, 0.06, 0.075 and 0.1 gm. Except for slight headache and flushing of arm and face the patient noticed no untoward symptoms. The sixth injection of 0.12 gm. gave a more marked reaction, the patient complained of severe vertigo, palpitation, flushing of the arm and severe headaches, soon after the injection. The symptoms subsided in about an hour. Six more injections of 0.1 gm. were given and after 10 injections the fever fell to normal in the morning rising to 99°F. in the evening. After the 11th injection the patient was afebrile and has not had any rise in temperature since. The spleen on the 1st March was reduced in size to 3 fingers and the liver to 1 finger below the costal margin. General condition showed marked improvement and anæmia responded to iron.

Discussion.—In both the above cases the parasite was demonstrated in the spleen or bone marrow or both. The diagnosis is thus beyond any doubt. The movements of these cases before their illness were carefully ascertained. 1 had not been outside Lahore in the preceding 7 years. He lived in the thickly populated old Tehsil area inside the city. It was stated that his brother had come from Calcutta about a month previous to the onset of fever but neither the brother nor any member of the family suffered from fever. Whatever the source of infection, he got infected at Lahore. Case 2 was moving between Lahore and Mussoorie. In early 1946, i.e. up to March, she was in Lahore and then moved direct to Mussoorie. She did not break her journey in the way nor did she come down from Mussoorie or visit any other place. She started getting pyrexia in November 1946, and evidently got infected at Mussoorie during the summer months. The occurrence of these cases, particularly the first one who never moved out of Lahore, raises the question of true endemic limits of the disease.

The endemic zone of kala-azar in Northern India is said to be confined to Assam, Bengal,

Bihar and United Provinces, particularly in the valleys of the great rivers and extending north to the foot of Himalayas. The western boundary is said to be situated on a line joining Bombay and Delhi, because areas beyond this line exhibit extremes of temperature. Sinton maintains that ideal conditions for the spread of kala-azar are existent in the areas where the mean daily temperature usually does not fall below 60°F. in the winter nor rise over 85°F. in summer, because those are the ideal conditions for the breeding of *Phlebotomus argentipes*, the universally recognized vector of kala-azar.

Regarding the distribution of this sandfly Brunetti (1912) has stated that P. argentipes is probably distributed all over the plains of India, as it occurs at least in Calcutta all times of the year. Towards the United Provinces it has been recorded as far as Lucknow. In one of his papers Sinton (1924) admits that our knowledge of the distribution of the various species of Phlebotomus is still scanty and it may be found on further investigation that P. argentipes has much wider distribution than is at present known. Indigenous cases have been reported from other non-endemic areas in the country, viz the west coast (Mudaliar et al., 1926), Malabar or Coimbatore (Shortt and Swaminath, 1937), Vizagapatam (Raman, 1944). Hance (1924) recorded indigenous cases of kala-azar in Dera Ismail Khan in the adjoining province of North-West Frontier. The cases were proved by the demonstration of the parasite in two of them.

In the Punjab the existence of P. argentipes was first recorded by Sobti in his thesis entitled 'Systematic study on seasonal prevalence and bionomics of sandflies of Lahore'. He examined 2,862 sandflies captured in the various parts of this city and out of these five were P. argentipes. These he obtained from the Canal Park area and from the tract lying between the Lahore railway station and Mcleod Road. He found them during the months of August and September when the temperature in the catching stations ranged between 72°F. and 94°F. and relative humidity varied from 55 to 96 per cent. This offers an explanation of case 1 having got the infection in this city, though his fever started in early summer. The occurrence of indigenous kalaazar in Lahore should, therefore, be kept in mind by the practitioner. By doing so more cases may come to light in due course. Hance's observa-tion in North-West Frontier Province as far back as in 1924 and our findings under report suggest that the true incidence of kala-azar in North-Western India may have escaped attention because of the teaching that disease has a strictly limited geographical distribution. Or else it may confirm the view of kala-azar workers that an increase in the incidence of kala-azar has been noticed in the past 3 years.

Summary.—Two cases of kala-azar have been reported—one of which got infected in Lahore.

Evidence in favour of possible indigenous infection has been produced.

The authors are grateful_to Dr. P. C. Sen_Gupta, Medical Officer In charge, Kala-azar Research Department, School of Tropical Medicine, Calcutta, and Dr. D. R. Mehta, M.Sc., Ph.D. (Cantab.), Entomologist, Public Health Department, Punjab, for furnishing valuable information regarding epidemiology of the

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The Indian Medical Gazette Fifty Pears Ago

CHLOROFORM ANÆSTHESIA

(From the Indian Medical Gazette, 33, 221)

Many years have elapsed since the Hyderabad Commission undertook its well-known enquiry into the action of chloroform vapour, and since then the subject has been widely and incessantly discussed. Notwithstanding the great amount of interest that has been excited by the subject, and the large amount of energy that has been displayed by those who have taken part in the enquiry, it can hardly be said that our knowledge of the action of chloroform has been advanced to any appreciable degree, nor that any of the points at issue has been settled.

Chloroform continues to claim as many victims as of yore, and its use as an anæsthetic has, in some quarters at least, been more loudly condemned than ever. Moreover, the diversity of opinion regarding the best method of administering the anæsthetic appears as remarkable as ever.

The confusion which surrounds the subject becomes daily more embarrassing to the surgeon, who has much operative work to perform. On the one hand, he is met with the difficulties and restrictions of ether anæsthesia, whilst, on the other hand, he is confronted with the supposed dangers of chloroform. He is assured by one authority that the use of chloroform as an anæsthetic is entirely devoid of danger, whilst others, who claim equal experience, maintain that its use is almost criminal. There is little doubt that one explanation of the meagre re-

Its which have followed this enquiry is the t, that the discussion has, from its commencent, been carried out in a spirit of such violent

controversy, that the discussion has tended from time to time to lapse into a mere exchange of. personalities.

The unfortunate introduction of the controversial element into the discussion has tended not only to clog the progress of the investigation, but has also served to obscure the issue, and divert the course of enquiry into channels of minor importance.

One of the most remarkable points in connection with the subject, and one which has hitherto received but little attention, is the fact that chloroform anæsthesia is carried out with such remarkable success in India, and with an immunity from fatal results unknown in England or America.

Hardly a week passes without the record appearing in one of the English journals of one or more deaths from chloroform, yet the pages of the Indian Medical Gazette for the past ten years contain reports of only 3 fatal cases. It is quite possible that other cases may have occurred besides those which have been recorded, but the proportion of such unrecorded cases is probably quite as great in England and America as in India.

The comparative safety of chloroform anæsthesia in India is a fact which merits the closest enquiry, and we believe that such an investigation would be likely to produce more fruitful results than some of those others which have

been undertaken in the past few years.

The conditions under which chloroform is used as an anæsthetic in India differ very widely from those which exist in England. In the first place, as the operation is conducted with open windows and doors, the air which the patient breathes is much purer, and the percentage of carbonic acid gas is very much less than it is in colder climates. In the second place, the temperature of the air is very much higher as a rule than in England, and evaporation proportionately increased. It is quite conceivable that both these conditions should have the effect of minimizing the danger of chloroform anæsthesia.

Another factor which possibly may have a favourable influence is the fearlessness of the natives of India in regard to the effects of chloroform. The ignorant classes in India, who form such a large bulk of those treated in hospitals, seldom exhibit anything like the amount of fear of the anæsthetic which is so common amongst English people; a fear which in the latter case is justified by the frequency of fatal results in their country. In England there are probably few persons who have not had personal knowledge of some fatal cases whilst in India the opposite is the case.

We draw attention to these facts as affording indications as to the direction which such an enquiry should take. There are doubtless many other circumstances which share in producing a condition more favourable to chloroform

anæsthesia as practised in India.

We believe that an enquiry into the matter would prove of great value, and we trust that ere long, some one may be induced to undertake an investigation of this nature.

Current Topics, Etc.

Twins and Their Medico-Social Importance*

By K. A. SHAH, M.B., B.S.

· Ranchhodlal Dispensary, Panchkuva, Ahmedabad

VARIETIES OF TWINB

THERE are two kinds of twins: those that arise from one fertilized ovum called monozygotic or one-egg twins and those that arise from two separate ova fertilized by two separate spermatozoa, called dizygotic or twoegg twins. Man is the only mammal known to produce both kinds. One-egg twins are also called uniovular (which means the same thing) or monochorionic or identical twins; whereas the latter are called binovular, dichorionic or fraternal. The words monochorionic and dichorionic were chosen under the belief that all one-egg twins have a single common chorion and all two-egg twins have each a separate chorion. But this is not true, for some pairs of one-egg twins do have separate chorions. Gardner and Newman (1942) warn us, 'At the risk of repeating what has often been said before, we must say once more that the membrane method of diagnosing the zygotic origin of twins and multiple human births has had to be abandoned by twin specialists. It has been found that a considerable fraction of twin births, diagnosed at birth as definitely disherionic turned out or later appears to the second of the s dichorionic, turned out on later careful examination to be among the most nearby identical pairs in a large collection of twins. Hence there seemed to be no escape from the conclusion that some dichorionic cases

are monozygotic'.

The method now universally adopted is the 'similarity method'. Because one-egg twins are bearers of the same hereditary materials, they are more similar in certain physical traits that two-egg twins who are bearers of different heredity. Newman (1942) has been using for many years the following method, and claims that he has used it 'before any other such methods had been published: (1) They must be strikingly similar in general appearance, especially in features, including various intangible resemblances. (2) They must be essentially identical in hair colour, texture and form. (3) They must have practically the same shade form. (3) They must have practically the same shade of eye colour and essentially the same colour pattern in the iris. (4) They must have essentially the same skin colour and texture (complexion) unless one is more tanned than the other. (5) There must be no marked than the other of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same of each or the same shade of each or the same colour pattern in the iris. tanned than the other. (5) There must be no marked difference in eyelashes, eyebrows, lips, shape of ears, or in shape, size and arrangement of teeth. (6) They must have hands, fingers and fingernails essentially the same in shape and size. (7) The general character of patterns and main lines of finger and palm prints must be essentially the same. (8) There must be at least as strong a resemblance between the two individuals of a twin pair in item seven as between the right and the left hand of the same individual. One-erg twins always belong to the same blood-group

One-egg twins always belong to the same blood-group and the same type and even have the same Rh factor as shown by Strandskov and Diederich (1946).

FREQUENCY OF TWIN BIRTHS

For European countries, the ratio of twin births is given to be 1 in 80 by Kenny and Chassar-Moir (1938) as well as by Lenz (1931); that for the U.S.A. is 1 in 86 by Newman (1942). The first attempt to assess the frequency of twins in India was made by Sin Assess the frequency of twins in India was made by Sir Kedarnath frequency of twins in India was made by Sir Kedarnath Das in 1934. He found a frequency of 1 in 43 for Madras and 1 in 59 for Bengal (cited by Sarkar, 1943-44). Later work done by Sarkar does not confirm this ratio. Sarkar (1943-44) has collected statistical data from various hospitals in India, which show that this ratio in India is 1 in 79 or 1.27 per cent, almost the same as in European countries. In the V. J. Hospital (which is the biggest maternity hospital) in Ahmedabad. (which is the biggest maternity hospital) in Ahmedabad, I find that there were 126 twin births out of 9,847 total pregnancies (from 1940 to 1947 excluding 1944 for which pregnancies (from 1940 to 1947 excluding 1944 for which year figures were not available), or 1 twin birth to 78.1, which closely corresponds to the ratio obtained by Sarkar. The figures from the V. J. Hospital for 1946-47 also give a ratio of 1 to 80. But when we take the figures for the whole city of Ahmedabad, we find that there were 709 pairs of twins out of 107,501 total living births within the last 5 years. This gives us the proportion of 1 in 149.6 or 0.66 per cent. This result is very much nearer to the figures of Ceylon given below. Two conclusions emerge from the data presented here. One is that the frequency of twins in warm climates is smaller than that in temperate regions; and that hospital statistics do not give a true picture and that hospital statistics do not give a true picture because more women who are potentially twin-bearers resort to hospitals than do mothers of singletons.

A curious numerical relation appears to exist between the ratio of twins, triplets and quadruplets to single births. Hellin in 1895 first suggested that if the ratio of twins is 1 to X, that of triplets is 1 in X² and quadruplets 1 in X³. Hellin's law was forgotten and rediscovered 25 years later by Zeleny. This law has been found to held good in reversely. has been found to hold good in general. For example, Neef reported that among about 50,000,000 births in Hungary, the ratio for twins was 1 to 82, that of triplets 1 to 80², and that of quadruplets 1 to 82² (Newman, 1942). In 1939-40 in the U.S.A. there were 4,620,000 births among whom 49,884 were twins, giving a ratio of 1 in 93. The expected number of triplets and quadruplets (1 in 93² and 1 in 93³) should be 535 and 6: the actual number of triplets were 521 and and 6; the actual number of triplets were 521 and quadruplets 5 (Peller, 1944-45). Quite a close correspondence! Sarkar's figure show a triplet ratio of 1: (82.5)² for India. No separate records are kept for triplets in our city, and in the V. J. Hospital no triplets have been recorded in the period indicated.

It appears that the frequency of twins varies in different countries as shown in table I.

Another suggestive fact brought out by the table is Another suggestive fact brought out by the table is that among the major subdivisions of mankind (Caucasoid, Mongoloid and Negroid) the Caucasoid or the white race has a higher frequency than the Mongoloid or yellow race. Sarkar (1943-44) also found a high preponderance of twin births among the Brahmans of Bengal; but the contention of Sir Kedar Nath Das in 1934 that there is a distinctly greater tendency to twin formation in coloured races' is not borne out by the figures obtained from Ceylon, which shows a ratio of 1 in 161.1 or 0.62. shows a ratio of 1 in 161.1 or 0.62.

shows a ratio of 1 in 161.1 or 0.62.

It is found that twins are more frequently of like sex than of unlike sex. Nichols found that during the ten years from 1890 to 1900 there were 453,809 same sexed pairs and 264,098 opposite sexed pairs. Now all two-egg twins have an equal probability of being of the same sex or unlike sex. Since 264,098 were of unlike sex, 264,098 must also be of the same sex, which means that 528,196 must be two-egg twins in all. Subtracting this from the total number of twins we arrive at the figure 189,713 which gives the number of one-egg twins, or a little more than 26 per cent of all twins are one-egg twins. This method of arriving at the frequency of one-egg and two-egg twins is known as the Weinberg Differential Method. In several cases actually diagnosed by Newman (1942), also the frequency of one-egg twins was about 25 per

^{*}A paper read under the joint auspices of the Ahmedabad Medical Society and the Ahmedabad Gynecological and Obstetric Society on 9th November, 1947.

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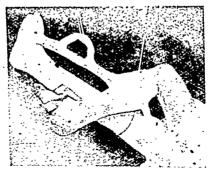
Fig. 1

CASE HISTORY. — 16/11/45 Excision of gangrenous area and raising of delayed skin flap on R. calf. Pressure dressing, and penicillin cream to L. foot daily. 4/12/45 Flap on R. calf raised and attached to raw area on L. foot. Fixation in Gypsona with flap relaxed (Figs. 2 and 3). 15/12/45 Sutures removed from flap graft. Showing satisfactory healing. 24/12/45 Under local anæsthetic flap detached from calf to foot; sutured in position. Remainder of flap sutured back to calf. 22/1/46

TOES GANGRENE OF

Repair of Skin with Cross-flap Replacement

A boy, aged 17, was admitted to Hospital on 22/10/45, having sustained a crush injury of 3rd, 4th and 5th toes, on the same day. Examination showed complete sensory loss on three toes with discoloration and obvious grave interference with circulation. Line of democration and obvious grave interference with circulation. marcation gradually developed and on 12/11/45 there was established gangrene as shown (Fig. 1).



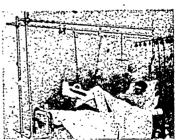


Fig. 3 (Top)

Fig. 4 (Below)

Fig. 2

Complete take of graft. Penicillin applied. Commenced foot exercises. 29/1/46 Wound soundly healed. Dressing discontinued. Patient commenced walking. 11/2/46 Excellent result flap graft. No pain. Walking well in normal shoes. R. foot normal. No fibrosis of gastrocnemius. Discharged. (Fig 4). In the belief that it will be of general interest, details of this authentic case are published by T. J. Smith & Nephew Ltd., of Hull, England, Manufacturers of Elastoplast and Gypsona.



An Illustrated Key to the Identification of

THE ANOPHELINE LARVAE

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By C. STRICKLAND, M.A., B.C. (Cantab.)

Late Medical Entomologist, F.M.S. Government, Professor of Medical Entomology in the School of Tropical Medicine, Calcutta

K. L. CHOUDHURY, M.B., D.P.H. (Cal.)

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TABLE I Percentage of twin births to total births in various countries and cities

Rank	Country, City, Race	Percentage of twins
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Belgium Calcutta (purc Indians) Finland (Helsingfors) Denmark Sweden Norway Negroes (United States) Netherlands Korea Poland New Zealand Germany Bulgaria Canada Hungary Italy	1.79 1.69 1.65 1.59 1.46 1.45 1.42 1.34 1.34 1.34 1.30 1.25 1.23 1.19
17 18	South African Europeans	1.16
19	United States (White)	1.15
20	Uruguay	1.14
21	Ontario (Canada)	1.14
22	Calcutta (Europeans and	1.08
23 24 25	Eurasians). Australia Argentina Greece	1.07 0.82 0.76 0.69
26 27	Japan Brazil	0.68
27 28	Pueblo Indians	0.64
28 29	Formosa (aborigines)	0.49
30	Columbia (S.A.)	0.40
31	Formosa (Chinese origin)	0.34
32	Formosa (Chinese origin) Chinese (San Francisco, U.S.A.)	0.30
33	Cochin China (Annamese)	0.01
		1

cent. Fisher states that of all twins three-fourths are binovular twins and one-fourth are monovular. Applying the method of Weinberg to figures for India, Sarkar finds that 64.7 per cent are two-egg twins and 35.3 per cent are one-egg twins. In a small series of 35 twins studied by me, 26 were of the same sex and 9 of opposite sex. Applying the Weinberg method to those figures 17 were monozygotic and 18 were dizygotic pairs or nearly 50 per cent! These figures show that the percentage of one-egg and two-egg twins may vary from place to place. In Japan, for example, there are, according to Komai and Fukuoka (cited by Newman, 1942), only 27 per cent of two-egg twins. Newman, 1942), only 27 per cent of two-egg twins. Since the frequency of total twin births is much less in Japan, the authors suggest that this is due to shortage of two-egg twins. It thus appears that different countries vary in the frequency of two-egg twins but that one-egg twins occur with the same frequency all over the world.

THEIR IMPORTANCE

The study of twins has contributed much to the elucidation of the problem of heredity.

elucidation of the problem of heredity.

As we know one-egg twins are identical in heredity whereas two-egg twins are hereditarily different. If then a trait or character is invariably alike in one-egg pairs but usually different in two-egg pairs, we can conclude that that particular trait is hereditary. If on the other hand, one-egg twins differ as much as two-egg twins in respect of any character, that character is certainly not hereditary but environmental. The first scientist to make a systematic use of twins in this way was Siemens. a prominent European dermathis way was Siemens, a prominent European dermatologist. He showed that nevi or birth marks are always hereditary. Siemens' pioneer work was soon followed by similar studies in other countries. These

studies have shown that the blood-groups and bloodtype, the capacity to taste phenylthiocarbamide and palm and finger prints are completely hereditary characters; whereas eye-colour; hair-colour; shape, length and colour of eyelashes; shape, position and colour of eyebrows; boundaries of hair on neck and forehead; skin colour and texture, commonly known or complexion; presence or absence size and abundance as complexion; presence or absence, size and abundance of freckles; size and form of nose, mouth and ears; size, form and thickness of finger nails are all 'almost fully hereditary'. Dental irregularities were shown to be strongly inherited by Goldberg. Korkhaus has shown that the teeth of one-egg twins are closely similar in shape, size, colour, arrangement and even in susceptibility to caries. Geyer of Germany has shown that even sleeping and waking peculiarities are not due to bad or good habits but are a matter of heritage. bad or good habits but are a matter of heritage. Bossik of Moscow has demonstrated that the time at which an infant begins to walk (but not the time of sitting up) is largely determined by heredity. Richard Luchsinger in 1944 reported that the voice also was a hereditary trait (Eug. Rev., April 1946). Even the action of the heart appears to be largely determined by heredity for the electro-cardiograms of one-egg twins were found to be closely similar (especially the T-wave) whereas those of two-egg twins were seldom so. In the matter of immunity to infectious diseases. so. In the matter of immunity to infectious diseases, twin studies by Russian and German twin specialists show that heredity plays an important rôle in susceptibility to measles, chicken pox, mumps, scarlet fever and German measles. Kollmer and Reisner (1943) have recently shown that even in the case of tuber-sulesis heredity plays not an inconsiderable part. They culosis heredity plays not an inconsiderable part. They took a twin suffering from tuberculosis as an index case and examined the parents, brothers, sisters and other relations of that case. After a study of 666 twin parents, 930 full siblings, 74 half siblings, 688 parents and 228 marriage partners of twin patients, they found that the chance of developing manifest tuberculosis increases in strict proportion to the degree of blood relationship: the rates being 7.1 per cent in marriage partners; 11.9 per cent in the half siblings; 16.9 per cent in the parents; 25.5 per cent in full siblings; 25.6 per cent in dizygotic twins; and 87.3 per cent in monozygotic twins.

Even when we consider the less tangible and immeasurable characters which go to make up the psychology of an individual, we find that twin studies throw a flood of light on the part played by heredity. Intelligence tests carried out on identical twins, fraternal twins and other groups show that the similarity between I.Q.'s of two individuals varies according to the nearness of their relation. The coefficients of correlation for intellectual resemblance among groups exhibiting different degrees of genetic relationship are given by Schlesinger (1933) as under:—

Physically identical Parent and child 0.31 twins 0.90 Cousins 0.27Like sex twins ... 0.82 Grand parent and grand child .. 0.16 Unrelated children 0.00 Fraternal twins ... 0.70 Unlike sex twins 0.59 Siblings 0.50

How closely similar are identical twins in their intellectual make up may best be illustrated by an incident from My Twin Joe reproduced by Newman (1942). Joe and his twin had puzzled their teachers by giving identical replies to examination questions. One of the teachers suspected some trick and it was therefore arranged that the twins should be sented One of the teachers suspected some trick and it was therefore arranged that the twins should be seated in separate rooms. At the end of the test, the principal called the twins and the sceptical teacher to his office. He was quite excited. 'Boys' he exclaimed, 'your latin papers are identical. The same words, the same syntax, the same grammar, but strangest of all, the same mistakes' the same mistakes'.

Rosanoff and his associates studied 1,014 pairs of twins in which one or both members of a pair was mentally abnormal. As a control study they examined 308 pairs of normal twins. This study has shown that, (1) only about half the cases of mental deficiency are hereditary; (2) that heredity plays an important rôle

schizophrenia, manic-depressive psychosis and epilepsy, though heredity by itself is often not adequate

to precipitate the disease.

The twin studies of Lange, Kranz and Legras prove beyond question that hereditary factors bulk large

among the causes of criminal behaviour.

Professor Freeman, an educational psychologist. Professor Holzinger, an educational statistician and Newman, a specialist in the biology of twins, studied fifty pairs of one-egg twins reared together (control group) and fifty pairs of two-egg twins also reared together. In a second experiment they studied the same control group with twenty pairs of one-egg twins separated in infancy and reared apart under different environments. These investigators have worked out the share of heredity and environment in determining various characters as shown in table II.

TABLE II

. Character	Percentage of variance due to heredity	Percentage of variance due to environ- mental and other factors
PHYSICAL CHARACTERS—Standing height Sitting height	81 76 78	19 24 22
Head length Head width Total finger ridges ABILITY TESTS—	78 75 90	22 25 10
Binet mental age Binet I.Q. Otis test score Otis I.Q.	65 68 77 80	35 32 23 20
EDUCATIONAL TEST (Stanford Achievement)— Word meaning Arithmetic	68 12	32 88
Science History and literature Spelling Educational age	34 45 53 64	66 55 47 36
Test of motor activity AND EMOTIONAL BALANCE— Woodward Mathews Tapping test-wrist Tapping test-finger Tapping test-total	30 27 46 50	70 63 54 50
	1	

this table, certain general conclusions are '(1) Every trait or character should be studied separately, for each involves different shares of hereditary and environmental influences. (2) Physical characters in general are more influenced by intelligence tests. (3) Mental ability is more influenced by heredity than is educational performance as measured by achievement tests. (4) Motor activity and temperament seem to be least influenced by heredity. (5) It is also interesting to find that differences in arithmetic ability seems to be only slightly hereditary, whereas spelling ability differences seem to be more than half

hereditary A pair of twins called Edwin and Fred, for example, were separated in infancy; brought up by different foster parents who lived a thousand miles apart. Yet when Newman and his associates brought them together when Newman and his associates brought them together for study they found that both were interested in electricity, both became expert repair men; they were married the same year to young women of about the same age and type. Each had a baby son and each owned a fox terrier named Trixie.

Chang and Eng the two famous Siamese twins (from whom the phrase is derived, though they were Chinese)

were born joined together by a bond in the region of the umbilicus. They married sisters and produced normal families. They could sleep, dream and think independently. Hunger, thirst, and the calls of nature were generally responded to simultaneously, but not always necessarily so. At the age of sixty-three, one night Chang suddenly died, and Eng, waking horrified by the tragedy followed him in two hours. Even the sanest and bravest man couldn't possibly live joined to a corpse!

Rosa and Josepha Blazek were joined by their sacra and shared a common genital tract. Their sexual inclination was different, and Rosa conceived and bore a normal child, but both twins secreted milk in their

breasts.

Newman (1942) informs us that those who studied Chang and Eng emphasized their different dispositions and temperaments. Chang, for example, was inclined to drunkenness while Eng was a teetotaller. Of the two sisters Rosa and Josepha, Rosa was taller and thinner and looked younger whereas Josepha was shorter and heavier. Josepha had a rudimentary vagina and uterus whereas Rosa was normal in these respects.

The Hilton Siamese twins of England were examined by Newman himself. He reports that the girls were distinctly less similar than any separate one-egg twins seen by him. One was taller, and thinner, and prettier. Even their mental abilities were different: the I.Q. of one being 59 and that of the other 42—a difference of 17 points! Such a difference is never found among

one-egg twins reared together.

TRIPLETS, QUADS AND QUINTS

The Dionne quintuplets born in May 1934 are still alive and kicking (see plate XV). The quints, all belong to blood-group O, have the same skin colour, eye colour, hair colour and form, same iris pattern, same type of eyebrows and eyelashes. They are all tasters of phenylthiourea. They are also alike in their possession of a number of rare characters such as syndactyly and unusual palm patterns. Though no intelligence tests have been published, other mental tests have been carried out on the quints which show that the children differ in their mental abilities. Some people are inclined to stress this dissimilarity which is really insignificant but Newman believes that this is due more to the pre-natal environment rather than the post-natal environment. For, it has been found that the mental development varies consistently with the physical—the child who was best developed at birth ranks first whereas the girl who was least developed ranked the lowest. What is still more to the point is that in spite of the best medical care, most favourable environment and excellent training the quints are in no way superior to the average child; contrary, they are somewhat retarded mentally.

contrary, they are somewhat retarded mentally. The Morlocks are one-egg quads (the only living example); another the Schenses are a four-egg set. The Morlocks are similar in all measurable traits whereas the other are quite distinct. Further, the slight variations shown by the one-egg set in intelligence coincides exactly with the slight variations in their weights and heights. The study of Brintle (quoted by Schlesinger, 1933) is still more interesting because his quadruplet set consisted of one pair of identicals and quadruplet set consisted of one pair of identicals and one pair of fraternals, brought up under the same concludes, environmental conditions. Brintle appears that random environmental influence have very little or no effect in causing the identical twins to grow more unlike. Furthermore, it does not seem that the fraternals have been more like the identicals, but rather that factors of heredity have been most influential. Studies made on triplets, by Clarke and Revell (1930) for example, also confirm such findings.

ARE TWINS MANDICAPPED?

In twin pregnancy (or plural pregnancy) there is always overcrowding of the uterus resulting in unfavourable presentation. Further, premature birth is extremely common in twins (and almost universal among triplets, quadruplets and quintuplets) and averages over 50 per oent. In my series of 35 cases there were 12 of premature

PAIN ENDS...



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labour and 2 of miscarriage. If we take these together, it gives us an average of 40 per cent. The rate of premature labour and miscarriages (combined) in case of singletons in the same hospital is 13.5 per cent. Again, many twins are born dead or die during the first ten days of birth. 'Adequate statistics show that, on the average, from three to four times as many two-egg twins are born dead as is the case with singly-. Even ii both members of a pair survive the porn'. Even it both members of a pair survive the hazards of birth, they are still far from safe. 'According to the extensive records of Viennese lying-in hospitals, over 23 per cent of twins die during the first ten days after birth, as contrasted with about 9 per cent of singly born'. My records show that of 35 pairs, only 19 pairs left the hospital alive. The proportion of stillbirths and neo-natal deaths together was 41.1 per cent. This ratio in the case of singletons was 41.1 per cent. This ratio in the case of singletons born in the same hospital is 15.1 per cent.

Very few twins have been famous in history, past or present. Newman mentions that Bach twins who were famous musicians, the Pickard twins of to-day well-known for their stratosphere exploits, the Grosvenor twins, one of whom is president of the National Geographic Society, and there his list ends: Scheinfeld (1939) mentions a set of triplets who are well-known scientists in America, viz, Robert, Wallace and Malcolm Brode, physicist, chemist and zoologist respectively. And I know of only one case in Indian life—that of the Mudaliars.

WHAT IS THE CAUSE OF TWINNING?

Wilson (1930) who studied 198 pairs of like sexed twins is not inclined to attribute this tendency to heredity. His study, however, is vitiated by the fact that many of his twins must have been one-egg twins. MacArthur (1948), on the other hand, states that 'fairly convincing evidence is available for twins, triplets and quadruplets that polyovulation is an inherited character with a late age expression in mothers. . clearest evidence on this point is afforded by an elaborate study by Bonnevie and Sverdrup. They found that two-egg twinning is common in certain families but not in others. They suggest that this tendency is probably inherited as a recessive character. They also noticed that certain women were twin repeaters or showed 'excessive multiparity'. One woman had four successive twin births and finally a single birth. Davenport has described an extremely remarkable case of a woman, three times married, who had fifteen plural births, including seven pairs of twins, five sets of triplets and three sets of quadruplets. This woman's mother and maternal grandmother had both been bearers of several twins and multiple sets of offspring. Bonnevie and Sverdrup regard this type of excessive multiparity as a distinct type, probably inherited as a Mendelian dominant.

Schlaginhaufer (1941) found that of 18 cases, twinning could be demonstrated in both paternal and maternal collateral lines in eight, and in only one line in ten. In the family of the Gehri quadruplets (the only quads who are known to have reached the mature age of 60) who are a tetraovular set, the mother had twinning seven times in her paternal collateral line and five times in the maternal, and she is furthermore the maternal grandmother of two pairs of twins. In the family history of the Badgett quadruplets, Gardner and Newman (1942) report that the mother is one of a pair of one-egg twins. The father has a pair of twin brothers, and there have been several twins among the close relatives, especially on the mother's side. The authors regard two-egg twinning tendency as

weakly inherited'.

Two-egg twinning is also found to depend on the mother's age. 'The expectation that a maternity will produce a pair of fraternal twins evidently increases greatly with the mother's age, from 3.3 per 1,000 at ages under 20 to 12.6 per 1,000 at ages between 35 to 40' (Stocks, 1945).

In my small series, two had a previous history of twins, five had twins in their family and one had twins in the husband's family. Majority of these were two-egg twins so far as can be judged from the records. Most of the mothers were multiparas and the majority -26 to be exact-were between 21 and 30.

The incidence of monozygotic twins is approximately equal in all races and at all ages (MacArthur, 1942). Gardner and Newman (1942) believe that one-egg twinning is 'in some way dependent upon or at least favoured by two two-egg twinning'. We are equally ignorant as to the mechanism of one-egg twinning. On analogy drawn from lower organisms, Newman advances the hypothesis that at some stage in the development of a fertilized ovum, all growth comes to a standstill and the ovum divides into two. The division acts as a stimulus and growth proceeds in two separate and identical embryos.

I am greatly indebted to the authorities of the V. J. Hospital and the Ahmedabad Municipality for supply-

ing needed information.

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Psychosomatic Aspects of Allergic Disorder

Trans.

(Reprinted from Medical Newsletter No. 599, dated January 1948, prepared by the American Medical Association and issued by the U.S. Information Service, New Delhi)

Weiss has reviewed the psychosomatic aspects of allergic disorders, including asthma, migraine, dermatitis and others. In summary, he stated that the allergic and neurotic populations are so large that they must overlap. Therefore, both allergic and neurotic disorders will be bound to exist in some of the same individuals. In addition, personality studies suggest a more intimate connection—a specific relationship between neurotic character structure and allergic disorder—possibly representing parallel manifestations of the same basic fault, the one discharging on the levei of psychic representation through thoughts and feelings and the other on the physical level by means of disturbances in organic functioning.

Psychosomatic study of an allergic problem, therefore, utilizes both psychologic and physiologic techniques; diagnosis must be established not simply by exclusion or evaluation of physical characters but with additional positive evidence of personality disorder meeting certain psychosomatic postulates. This will

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Captain V. R. Ram. Dated 6th May, 1947. Captain S. Narayanan. Dated 16th May, 1947.

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Indian Land Forces—Indian Medical Service SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commissions)

Major Amarendu Sekhar Sen. Dated 10th June, 1947. Major Waman Dattatraya Sulakhe. Dated 7th July, 1947.

The undermentioned officers will relinquish their Emergency Commissions in the I.M.S./I.A.M.C. and A.I.R.O. (M) Commissions, and are granted Regular Commissions in the I.A.M.C. with effect from 1st November, 1947. Date of seniority for pay, promotion and pension will be adjusted later.

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RETIREMENTS

Lieutenant-Colonel (T/Col.) A. J. D'Souza, M.C., retires 21st May, 1946, and is granted the honorary tank

of Colonel.

Lieutenant-Colonel K. V. Ramana Rao retires 5th
June, 1946, and is granted the honorary fank of Colonel. Lieutenant-Colonel R. C. Wats. Dated 26th August,

INDIAN MEDICAL SERVICE

SECONDED TO THE INDIAN ARMY MEDICAL CORPS Lieutenant-Colonel R. Sen. Dated 20th November. 1947.

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Original Articles

DEEDS OF VIOLENCE IN INDIA IN 1935-36 AND 1945-46, AND OTHER CRIMES IN WHICH SEROLOGY PLAYS A PART

By S. D. S. GREVAL, B.Sc. (Punj.), M.D., ch.B., D.P.H. (L'pool)

LIEUTENANT-COLONEL, late I.M.S.

Scrologist and Chemical Examiner to the Government of India, School of Tropical Medicine, Calcutta

This communication follows a similar communication published ten years ago (Greval, 1937)

Exhibits for tracing origin of blood, etc., are received in the department of the (Imperial*) Serologist and Chemical Examiner to the Government of India, from all over India (and Burma), in connection with over 70 crimes described in the Indian Penal Code and Criminal Procedure Code, and listed in table I.

(* Old designation.)

TABLE I

Sections of Indian Penal Code and Criminal Procedure Code with which the medical man is concerned

Indian Penal Code

- 143. Punishment for being member of unlawful assembly.
- 147. Punishment for rioting.
- 148. Rioting with deadly weapons.
- 149. Member of unlawful assembly guilty of offence committed in prosecution of common object.
- 201. Screening offence.
- Possession of Queen's coin by person who knew it to be altered when he became possessed thereof.
- 277. Fouling water of public spring or reservoir.
- 279. Rash driving or riding on a public way.
- 289. Negligent conduct with respect to animal.
- 295. Injuring or defiling place of worship, with intent to insult the religion of any class.
- 296. Disturbing religious assembly.
- 302. Punishment for murder.
- 303. Punishment for murder by life convict.
- 304. Punishment for culpable homicide not amounting to murder.
- 304A. Causing death by negligence.
- 305. Abetment of suicide of child or insane person.
- 306. Abetment of suicide.
- 307. Attempt to murder.
- 308. Attempt to commit culpable homicide.
- 309. Attempt to commit suicide.
- 312. Causing miscarriage with consent.
- 313. Causing miscarriage without consent.
- 317. Abandonment of child under 12 years.
- 316. Concealment of birth by secret disposal of dead body.

TABLE I-contd.

- 320. Grievous hurt.
- 321. Voluntarily causing hurt.
- 323. Punishment for voluntarily causing hurt.
- 324. Causing hurt by dangerous weapons.
- 325. Punishment for causing grievous hurt.
- 326. Causing grievous hurt by dangerous weapons.
- 332. Voluntarily causing hurt to deter public servant from his duty.
- 333. Causing grievous hurt to deter public servant on duty.
- 337. Endangering life or personal safety.
- 339. Wrongful restraint.
- 341. Punishment for wrongful restraint.
- 342. Punishment for wrongful confinement.
- 354. Criminal force for outraging a woman.
- 359. Kidnapping.
- 362. Abduction.
- 363. Punishment for kidnapping.
- 364. Kidnapping to murder.
- 366. Kidnapping to compel her marriage, etc.
- 370. Buying or disposing of any person as a slave.
- 376. Punishment for rape.
- 377. Unnatural offence.
- 379. Punishment for theft.
- 380. Theft in dwelling house.
- 382. Theft after preparation for causing death.
- 392. Punishment for robbery.
- 393. Attempt to commit robbery.
- 394. Voluntarily causing hurt in committing robbery.
- 395. Punishment for dacoity.
- 396. Dacoity with murder.
- 397. Robbery with attempt to cause death or hurt.
- 398. Attempt to commit robbery with deadly weapons.
- 399. Preparation for dacoity.
- 420. Cheating and dishonestly inducing delivery of property.
- 428. Killing or maining animal worth Rs. 10.
- 429. Killing or maining cattle, etc., worth Rs. 50.
- 447. Punishment for criminal trespass.
- 448. Punishment for house-trespass.
- 451. House-trespass for offence punishable with imprisonment.
- 452. House-trespass after preparation for hurt, etc.
- 454. Lurking house-trespass or house breaking for offence punishable with imprisonment.
- 456. Punishment for house-trespass by night.
- 457. Lurking house-trespass by night.
- 458. Lurking house-trespass by night after preparation for hurt, etc.
- 459. Grievous hurt caused in house-trespass.
- 460. Jointly house breaking where death or grievous hurt caused by one.
- 461. Breaking receptacle containing property.

Criminal Procedure Code

- 54. Arrest.
- 174. Enquiry on suicide.

The department receives the exhibits from Chemical Examiners of the various Provinces. These experts after determining by the chemical means the presence of blood, when suspected to be present, forward the exhibit (or a portion of it) to the scrologist for determining the source

of blood by immunological means. Often they also send exhibits on which they have not found blood, with the remarks 'Blood not confirmed'. Material other than blood is also received and its origin determined by immunological means, after its identity has been established by other means, e.g. semen, flesh, bones, etc. The source includes human or animal body. The animal includes common domestic animals or their genera. For a special requisition, such as for the blood of a snake, special arrangements are devised for preparing the specific antisera with help from Zoological Gardens and Veterinary Colleges.

The aforesaid crimes provide a reliable comparison between different Provinces and periods. A full table of all such crimes was given in the previous communication and is given every year in the Annual Report of the Department of the (Imperial) Serologist and Chemical Examiner to

the Government of India.

Table II in the present communication gives (i) figures under six serious crimes, (ii) total of six serious crimes, and (iii) total of all crimes of violence for the different Provinces in India, in 1935-36 and in 1945-46. The addition of 'etc.' after an act is a legal manœuvre.

Observations on Table I

This table is of considerable interest to the medical men with a forensic bent of mind. A medical man giving evidence or scrutinizing evidence given by another medical man, for the benefit of the lawyer, must know the exact nature of the crime and all the possible loopholes, from a medical point of view, in what can be observed or stated in connection with the case.

The comparatively trivial failings of human conduct included in the list provide means of detaining a suspected wrongdoer with a view to obtaining further information. The provisions of the Criminal Procedure Codes also included in the list serve the same purpose.

Observations on Table II on the next page

The first period (1935-36) is representative of pre-World War II days. The second period (1945-46) is representative of post-World War II days, prior to the wave of communal frenzy which swept the country on and after 16th August, 1946, and has not yet subsided. Further, it completes a decade. Furthermore, it covers the entire land which has since been divided.

It will be seen that the War has made no difference to human conduct and affairs in India as a whole. This is unlike what has happened in England and is not surprising. The Indian criminal is also unlike his European opposite number: He is an impulsive subject rather than a cold-blooded designer of antisocial activities (Owens, 1935). The recent 'blood stains on the map of India' have been caused by political slogans, and fanatical war-cries which have turned respectable law-abiding and

God-fearing citizens into hooligans and fratricides. All this is in favour of recognizing in India, in assigning criminal responsibility, the existence of the Irresistible Impulse (Editorial, 1947). Superstition may at times also operate and provide an occasional instance of human sacrifice and suicide.

It will be also seen that some Provinces are more violent than others. Potentiality for violence per capita may be worked out from the population figures for the last census. On a rough estimate the Punjab is the most violent and Bengal the least violent part of India. This is also borne out by what happened in both these Provinces immediately before and after their partition.

A Case of Human Sacrifice

In the decade 1936-46 two cases of human sacrifice have been reported. The first case occurred in the Salem Division of Madras and was reported in the previous communication (Greval, loc. cit.). The second case occurred in 1943, also in Madras, and is reported in the following abstract:

'In the Court of Sessions, Ramnad Division at Madura, Sessions Case no. 33 of 1943.

Accused—Periasami Maniam.

Charge—Murder under section 302 of the Indian Penal Code.

(P.W. = Prosecution witness; D.W. = Defence witness; M.O. = Material object.—S. D. S. G.)

The accused is charged under section 302 I. P. C. with having caused the murder of his mother, Nallammal, aged about 60, by cutting her on the back of her neck and again on her left shoulder by an arrayal M.O.1. at about 8 a.m. on 29th of January last on the land of Macchakali (P.W. 12) in Tiruvendiyoor village

The next morning P.W.s 4 and 5 went to the land with a plough and a pair of bullocks. P.W. 5 being lame of one leg stood there on the land while P.W. 4 ploughed his land as also the land which had been sown the previous evening by the accused. The accused came and saw the ploughing and went back to the village and returned with an aruval in his hand and with his mother the deceased. The mother went along asking him to give her as sacrifice to the deity Karumparapayal and to cut her unhesitatingly lest his hand should shake. They came on the land and the accused cut her with the aruval on the back of her neck and again on her left shoulder and she fell down.

The blood-stained earth scraped by the Subinspector of Police from that spot the next morning was sent to the Chemical Examiner and the Imperial Serologist and was certified by them to be blood and human blood respectively. On the aruval itself there were no traces of blood, apparently because of lapse of time.

P.W.s. 16 and 17 depose that they saw the accused and the deceased going along that

TABLE II

Showing six serious crimes and total number of all crimes of violence in India in 1935-36 (below the line) and in 1945-46 (above the line)

5	(bel	ow t	he l	ine)	and	in	1948	5-46	(ab	ove	tne	une)			
	302 (Murder)	302 etc.	307 (Attempt to murder)	307 etc.	304 (Culpable homicide)	304 etc.	326 (Grievous hurt)	326 etc.	395 (Dacoity)	395 etc.	896 (Dacoity with murder)	396 etc.	Total of six serious crimes	Total of all crimes	·
Punjab (Population 28,418,819)	679 494	186 64	67 70	53 20	64 59	14 12	10 31	9 7		<u>-</u>	-	<u>-</u>	1.082 760	925	
Madras (Population 49,341,810)	662 769	$\frac{75}{2}$	29 49	<u>4</u> 1	15 19	$\frac{2}{1}$	10 39	1-	=	1 -	1	<u>-</u>	801 881	851 962	
United Provinces (Population 55,020,617)	215 296	55 43	31 53	<u>9</u> 8	$\frac{24}{22}$	<u>6</u> 8	<u>5</u> 8	<u>2</u> 5	<u>-</u>	2	$\frac{2}{2}$	- <u>-</u> -	351 446	587	
Bengal (Population 60,306,525)	89 143	54 53	8	3	<u>4</u> 15	11 10	8	<u>5</u>	9	5	4	 -	192 271	307 423	
Bombay	307 285	<u>-</u> -	26 5		<u>29</u> 29	=	14	-	5	- -	2	 -	383 335	469 389	
Burma	8 147	1 14	4	<u>-</u> -	<u>-</u>	<u>-</u>	52	<u>-</u>	<u>-</u>	<u>-</u>	-	-	10 228	12 291	Recent figure not significant.
Sind (Population 4.535,008)	139 104	<u>-</u> 14	<u>5</u>	<u>-</u>	3 16	<u>-</u>	2	3_	1	1_1_	1	1	156 145	181 161	Burma is no longer in India.
Bihar (Population 36,340,151)	193	100	1 -	<u>-</u>	31	37	9	4	8	<u>-</u>	3_	-	386	475	
Bihar and Orissa	155	-	<u>-</u>	-	<u>-</u>	_ 10	12		6		-	-	213	294	Partitioned in 1936
NW. F. Province (Population 3,038,067)	71 84	22 22	11 3	6 9	28	-	1 6	-	<u>-</u>	1	-	<u>-</u>	119	138	into 'Bihar' and 'Orissa'.
Central Provinces (Population 16,813,584)	104 82	35 14	6	1 2	1 3	<u>-</u>	1 10	<u> </u>	<u> </u>	1 - -	<u> -</u>	<u>-</u>	14R 111	167	
Orissa (Population 8,728,544)	29		1	<u>-</u>	4		<u>-</u>	<u> </u>	1	<u>-</u>	2_	<u> </u>	41	49	
Assam (Population 10,204,733)	26 44	7 10	-	<u>-</u> -	1 4	$\frac{2}{2}$		<u>-</u>	1 2	-	<u>-</u>	<u>-</u>	37 65	<u>46</u> 82	
Indian States (Population 90,811,634) Centrally administered areas Ajmer-Merwara	120	5 6	1 4	-	- 7 -5	<u>-</u>	1 3	=	-	<u>-</u>	-		134	165	
(Population 583,693) Delhi	4		-	<u> -</u>	3	<u>-</u> -	<u>-</u>	<u>-</u>	<u>-</u>	-	<u>-</u>	<u> -</u>	7 4	10	
(Population 917,939)	11 10	1	1 4	<u>-</u>		<u>-</u>	<u>-</u>	=	<u></u>	-	<u>-</u>	<u> </u>	16	<u> 19</u> 16	
Deccan (Secunderabad) Military cases	$\frac{1}{2}$	<u>-</u> -	=	<u>-</u>		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	 	<u>-</u>	<u>-</u>	1 2	$\frac{2}{2}$	
Political agencies	-	-	<u>-</u>			-	<u>-</u>	=	<u>-</u> -	<u>-</u>		<u>-</u>	3	- 23	
Baluchistan	$-\frac{\dot{2}}{5}$		-		<u>-</u>	<u>-</u>	<u>-</u>		-	<u>-</u>	<u></u>		$\frac{2}{7}$		
	5	<u>-</u>		<u>-</u>	<u>-</u>	<u>-</u>	- <u>-</u> -	-	<u>-</u>		<u>-</u>	<u>-</u>	<u>9</u> 5	10	
· 								. ,		(Grani	TOT C	TAL	4 570 4,710	

morning, the accused with an arruval in his hand and that the deceased went exhorting the accused to offer her as sacrifice to Karumparapayal unhesitatingly. When this was put to the accused, he says that P.W.s 16 and 17 saw him go along that morning to his field with paddy to sow. P.W.s 16 and 17 are also independent witnesses. P.W. 16 denies that she is being maintained by P.W. 12. P.W. 17 says that P.W. 4 is her pangali and that she made no enquiry on the accused or his mother. These circumstances are not enough to discredit their evidence.

There is another set of witnesses. P.W.s 12 to 15 who depose that they were present that morning at a mandakal in the village in connection with a panchayat between the old man P.W. 15 and his son relating to a partition dispute between them. They say that P.W. 16 came there and told them that the accused and his mother were going towards the land, the latter telling the accused that he must unhesitatingly sacrifice her to Karumparapayal. P.W. 15 however says that what P.W. 16 said was that the accused and his mother were going towards the land. He adds that it was thought that there might be a disturbance and hence the people there left for the land. P.W. 15 is an old man and is semi-blind and deaf. Possibly he did not hear clearly all that P.W. 16 stated there. P.W. 16 says that she told P.W. 12 what she had seen and heard. It is thus clear that the accused and the deceased went together, the accused with an aruval and the deceased wanting him to cut her as a sacrifice, the idea being that a false case of murder should be foisted upon their enemies P.W. 12 and his

D.W. 2 says that P.W. 10's clothes had bloodstains which however is denied by P.W. 10. While according to D.W. 1, P.W. 4 ploughed the entire land that the accused had sown, D.W. 2 says that he ploughed only 2 or 3 furrows when the quarrel arose and the deceased was cut. D.W. 2 says that he met P.W. 9 on his way back to the village and told him not that anybody killed the deceased but only that she lay dead there. D.W. 3 is a poojari living in a house about 100 yards from the disputed land. He says that he heard a noise and turned in the direction from which it came and saw P.W.s 4, 5 and 10 to 12 with arrayal and sticks chasing the accused and catching him. He also says that P.W. 10 had an aruval in his hand and had bloodstains on him and that the accused was kept tied near the land in question. There appears to be enmity between this witness and P.W. 12 who filed a criminal case under the Cattle Trespass Act against him, though that case appears to have been compromised. According to D.W. 3, it was P.W. 11 that caught the accused first. He adds that he saw the deceased lying dead on the land and that to his enquiry the accused told him that it was P.W. 10 that had cut her. D.W. 4 is the

mother of D.W. 2 and says that she was cutting grass on her field four fields off the disputed land and heard a shout that P.W. 10 was cutting the deceased. She does not know who raised the shout but says that she ran away to the village as soon as she heard it without even ascertaining what the matter was. She admits that D.W. 1's wife is her maternal aunt's son's daughter. D.W. 2 says that D.W. 1 is his first cousin. Also D.W.s 1 to 3 are closely related to each other and are of the same caste as the accused. The accused in his report Ex. F did not mention the names of his witnesses. D.W. 1 however says that he was present when the accused made the statement and that the accused mentioned him as a witness. According to P.W. 9, D.W. 1 was not present on his land. The evidence of D.W.s 1 to 4 is interested and unreliable.

For these reasons, I find in agreement with the unanimous opinion of all the four assessors, that it was the accused that cut and killed the deceased.

The offence however does not amount to murder under section 302 I. P. C. because it falls under the 5th exception to section 300 I. P. C., he having committed the murder at the request and with the consent of the victim. Thus, it is an offence under section 304 I. P. C. (1st part) of culpable homicide not amounting to murder. The accused is convicted accordingly and, in the circumstances of the case, sentenced to rigorous imprisonment for ten years.'

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ADVANTAGES OF REGIONAL ANÆS-THESIA IN POOR SURGICAL RISK CASES WITH SPECIAL REFERENCE TO REFRIGERATION METHOD

(A REPORT OF 16 POOR RISK CASES)

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Selection of a proper anæsthetic for poor surgical risk cases always worries a surgeon. A 100 per cent safe general anæsthetic would have been best for both surgeons and patients but no such anæsthetic agent has yet been found out or thought of.

General anæsthesia.—Morland Smith says that general anæsthesia is a temporary pathological state, but with the improvement in methods of administration of the last few decades, there is a tendency for light general anæsthesia to be regarded as harmless. He states further that the duration of anæsthesia is a definite factor in the amount of constitutional upset and postoperative discomfort in the patient. Up to the

present day amongst the general anæsthetics nitrous oxide gas and oxygen are taken as the safest though they are not 100 per cent safe and efficient. Hence it cannot be used for all poor risk cases.

S. S. Dafae's work on anæsthetics in relation to shock showed that there was not much of difference in mortality rates when ether, N_2O

and oxygen or cyclopropane were used.

A. R. Hunter investigated the causes of postoperative shock and suggested that one of the probable causes of the progressive circulatory failure under general anæsthesia may be the poisoning of the heart muscle partly by the anæsthetic and partly by the tissue anoxia induced by lowered blood pressure.

From all these observations one conclusion can be drawn that any form of general anæsthesia discovered up till now will always entail some, however small it may be, additional burden on the system, a burden which the poor risk cases may not be able to bear. Really, it seems improbable that a 100 per cent safe general anæsthetic agent will ever be discovered.

In this connection I should like to mention two cases who showed the bad effects of even the light general anæsthesia administered for a very

short period of 15 to 30 minutes.

- 1. Muslim male, aged 28 with crushed injury of foot after being treated for shock for 3 hours, was operated on for cleaning the wound under open ether for 30 minutes. His blood pressure before the operation was 120/80 mm. of Hg. and his pulse rate was 120 per minute. After this small operation he was under post-operative shock with low B.P. (90/60) and rapid pulse rate (140) for more than 24 hours. Then he settled down.
- 2. The second case—the sad one of the two was a Hindu female, aged 40, who developed gas gangrene in left arm 3 days after her sustaining an open supracondylar fracture. Her condition was very low with imperceptible pulse. The surgical emphysema went up to the pectoral region. A few deep incisions were made in the arm and in the pectoral region. The whole limb extending up to pectoral region was covered with ice at the same time. Next morning the patient looked better and she was answering to questions. Her pulse was perceptible. Penicillin was started from the 2nd day. The patient improved for 3 days under refrigeration treatment and the infective process was definitely checked. On 4th night amputation was decided and the same had to be done under light ether anæsthesia as ice-box was noticed to be empty at the time.

It took only 15 minutes to finish the operation. Next morning she developed a very rapid and feeble pulse. About 11 a.m. she developed ædema of lungs. She died the same evening of post-operative heart failure due probably to the transient general anæsthesia as the gangrene process never extended any further.

Local anæsthesia.—Advocates of local anæsthesia say that it is 100 per cent safe,

can be used for all kinds of operation and in all poor risk cases. No doubt, local anæsthesia is 100 per cent safe. Local anæsthetic blocks the first path of the shock producing mechanism, i.e. the painful stimuli from the operation area and it is really an ideal anæsthetic for shock cases. But it cannot be used for all kinds of operation. It is not suitable for cases with spreading infections. It is not 100 per cent efficient for operations like amputation of limbs. And it is dangerous to use it in between the fractured fragments of bone or in a potentially septic street wound.

Regional anæsthesia: spinal and nerve block.—Next comes the regional anæsthesia. The first of its kind, the spinal block, is very suitable for all cases requiring surgery of lower extremities or lower abdomen but it is not at all suitable for poor risk cases as it always causes some fall of blood pressure. A blood pressure below 100 mm. of Hg. is always a con-

tra-indication to spinal anæsthesia.

Next in order and probably the best for the poor risk cases is the regional anæsthesia by nerve block. The regional anæsthesia by nerve block has a regards of local anæsthesia as regards of local anæsthesia as regards of local anæsthesia and these are:—

1. It can be used in all cases of sepsis provided the septic processes have not spread up to the level where the nerve has to be blocked.

2. It can be used 100 per cent efficiently in all

cases of amputation of limbs.

3. It can be used in all cases of fracture and potentially septic wounds of the extremities.

The only disadvantages are two in number:—
1. The regional anæsthesia cannot be used for all parts of the body though fairly accurate methods of nerve blocking have been found out for most parts of the body and though the regions unaccessible by nerve blocking can be successfully anæsthetized by the method of field blocking, i.e. creating a wall of anæsthesia encircling the field of operation.

2. One has to be well conversant with the anatomy of the parts in order to inject the nerve trunks properly and without injuring any contiguous important structure (viscera or blood vessels), though the percentage of such danger is very small if proper care is taken in the procedure as shown by Murphy's (Jr.) statistics in 45 cases of brachial plexus anæsthesia.

The following are some of the more recognized forms of regional anæsthesia:—

 Brachial plexus block in the neck.

For whole of the superior extremity excepting the upper part of the arm and shoulder which is supplied on the medial aspect by 2nd intercostal nerve and on the lateral aspect by the posterior suprascapular nerve.

- 2. Upper intercostal block
- Lower six intercostal block with posterior splanchnic block.
- 4. Blocking of—
 Femoral, sciatic, obturator, lateral femoral cutaneous, posterior femoral cutaneous nerves.
- Blocking of digital nerves at the base of fingers or toes.
- 6. Blocking of inferior alveolar nerves, superior alveolar nerves, mental nerves, etc.
- Caudal anæsthesia, i.e. extradural spinal block.

- For thoracoplasty, fracture ribs, etc.
- For abdominal operations.
- For operations on the lower extremity.
- For the distal half of the fingers and toes.
- For dental surgery.
- For obstetrical emergencies.

Refrigeration.—The last but not the least important in this series is the recently advocated refrigeration anæsthesia. In short it may be said that refrigeration anæsthesia is a 100 per cent safe anæsthesia, it has no contra-indication and it has no danger if used in the right way. It can be used by anyone and anywhere, i.e. in a hospital or outside. But it has limitations, i.e. it can only be used for affections of the extremities.

The introduction of regional anæsthesia by refrigeration has changed the aspects of limb surgery in poor risk patients. F. M. Allen and L. W. Crossman state that operation has not been refused to any patient since the introduction of the refrigeration method in New York City Hospital, in February 1941. As the method permits amputation without shock or immediate change in condition, it was felt that every patient, regardless of complication or weakness, is entitled to the possible benefit of removal of the principal source of intoxication. No harm was done in any case and a number of patients, supposed to be hopeless cases, were saved. In moribund patients, it might be preferable to postpone even a shockless operation if toxic absorption can be stopped by For this purpose the non-operative means. extremity is surrounded with ice or with thin ice-bags. The result is often dramatic over night with clearing up of pain, fever, delirium and prostration and creating of a much more favourable condition for later operation. As an example, one of my cases may be cited here.

H. B., Hindu male, 50 years, came on 19th January, 1948, with gangrene of right leg. There was surgical emphysema in the leg and he had diabetes (blood sugar 480 mg. per 100 c.c.). Patient was comatose with imperceptible pulse and with temperature 100°F. General condition being low, the right leg and half of the thigh were put in the refrigeration box (specially designed for Campbell Hospitalsize 36 inches by 12 inches by 12 inches). Next morning he was responding to questions and pulse became perceptible. About 2 p.m. the same day his blood pressure went up to 90/40 mm. of Hg., i.e. 20 hours after initiation of the refrigeration treatment. Straightway a guillotine amputation was done at the upper part of the leg and the patient passed over the crisis. Of course other treatments like penicillin, insulin, etc., were given as usual.

Thus it is seen that refrigeration method helps in treatment of many pathological conditions in the limbs besides producing anæsthesia and recently this beneficial effect has been utilized very much in gas gangrene and infective gangrene cases. In this hospital too there are 10 cases on record, who showed the good effects of refrigeration treatment in gas gangrene and in infective gangrenous conditions of limbs. Table I shows the details of the cases with results of treatment comparing effects of open ether with refrigeration anæsthesia in some of them.

Cure rate was 60 per cent in a group of 10 cases who were given up for lost so to say, as the following examples will show.

- 1. Pt. N. C. B., 14 years, Hindu male, came with gas gangrene of right arm following an open supracondylar fracture. He was semi-conscious and restless with a very feeble pulse of 160 per minute. The whole of the limb and the pectoral region were covered with ice and intravenous drip penicillin was started. Next morning to everyone's surprise the patient was found improved with a pulse of 120 p.m. Amputation was done straightway by the guillotine method, and the stump and the pectoral region were kept covered with ice for another 24 hours. The patient had an uneventful recovery.
- 2. Pt. T. S., 52 years, Hindu male, came with cellulitis of leg threatening gangrene after a crushed injury of the foot, temperature 102.8°F.

TABLE I

	Number of	Number of hours	Anæsthesia for	Results		
Disease	cases	of refrigeration treatment	amputation of the parts	Cured	Died	
Gas gangrene Gas gangrene Infective gangrene or traumatic gangrene.	3 1 6	24-72 24 24-96	Open ether Refrigeration Open ether 2 Refrigeration 4	1 1 1 3	2 1 1	

Refrigeration treatment was P/R = 118/24. combined with usual penicillin therapy and the patient was practically cured in 3 days' time. No operation was required.

3. The following is an example where good effect of refrigeration treatment was marred by

application of heat.

Gopal Sing, a young boy of 14 with open fracture of left tibia, showed signs of severe infection in 18 hours' time as he could not be touched earlier due to severe shock. His leg was put in the ice-box as soon as the temperature was high, i.e. after about 20 hours of injury. The boy improved the next day and temperature reached normal. But then this method of treatment was changed to older one of heat application even before the leg could be amputated. As feared the boy developed a very high temperature next day and died.

Principles of refrigeration.—The principles

set forth by Allen are as follows :-

Lowering of the temperature of the tissues reduces metabolism and hence decreases oxygen needs, diminishes absorption and formation of toxins and inhibits bacterial growth. Cold also produces anæsthesia. Tourniquet can be applied for many hours or even days with no harm to the ligated part or to the blood vessels in the constricted part if this part is immersed in ice water

or is placed in a pack of cracked icc.

Refrigeration produces a sort of physiological amputation, i.e. the toxic or gangrenous part is practically amputated from the time the same is put in the ice-box. In this connection there are differences of opinion regarding the temperature at which the limb should be kept and regarding the use of tourniquet before the level of amputation is fixed. Some use a Thermo Rite (an instrument which can maintain and regulate low temperatures) and keep the tissues at 10°F., i.e. (-10°C. approximate). This sort of low temperature freezes the tissues and kills all the cells. So if this method is used, all the tissues exposed to such temperature must be removed as soon as possible. More recently, it has been found that if the temperature is maintained between 1°C. to 5°C. (35° to 40°F.), the tissue cells are in hibernation and they quickly return to normal as soon as the cold is withdrawn.

The use of tourniquet is being restricted more and more nowadays. The limbs of the patients who are very severely ill from infection, diabetes, etc., are put in the ice-box without a tourniquet. The ice pack will maintain the proper temperature and can be kept for hours and days without any injury to the healthy tissues. Only exceptions to this method of treatment are elderly sclerotics in whom the ice packs are limited to the tissues which will be amputated later. When the patient's general condition improves a tourniquet is applied and amputation is done after another four hours.

Some surgeons use a two-tourniquet plan in severely debilitated patients. One tourniquet is applied just above the infected or injured area and the whole limb is kept in ice pack till the general condition improves when the 2nd tourniquet is applied 4 inches above the site of amputation 4 hours before the operation.

It is really surprising to see an old sick patient brought to the hospital in moribund state with gangrene of a limb and an amputation done under refrigeration anæsthesia with no pain, no fall in blood pressure, no rise in pulse rate, while the patient and the anæsthetist are carrying on a lively conversation. The advantages of the refrigeration anasthesia rather refrigeration method can be enumerated as

follows :-

1. Instantaneous relief of pain of the affected part.

2. Limiting of the activity and spread of infection.

3. Prevention of absorption of toxins from bacteria and damaged tissues.

4. Suspension of the diseased process so that the severely ill patient can be restored to balance by many other restorative treatments.

5. Preventing and combating surgical shock.

6. Protecting anæmic and potentially infected tissues, otherwise lost, by preserving them until

collateral blood supply develops.

It really widens the range of operability and includes those gravely ill patients who hereto-fore have been considered hopeless and too far gone for surgery. Most of these cases recover under this regime. In New York City Hospital the mortality rate was brought down to 15.5 per cent from 65 per cent by this method in gravely ill cases.

It may be noted here that refrigerated asphyxiated tissues do not have to be removed if they are not actually frozen and hence the recently improved method (i.e. keeping temperature between 1°C. and 5°C.) may be used for any operation of the extremities where no amputation is indicated, e.g. cleaning lacerated wounds, setting of fractures, etc. But most of the above cases can be tackled with other forms of anæsthesia with safety and refrigeration anæsthesia in my opinion should be kept reserved for all those cases who cannot be treated otherwise, i.e. for the gravely ill patients. The disadvantages of the method are small compared to the literal saving of life and limb to which so many references have already been made.

The sloppiness and the difficulties in ice packing can be obviated by using proper boxes with mackintosh under them and by raising the head end of the bed so that the water drains into a bucket. Sloughing of skin due to contact of ice can be stopped by covering the skin with a thin rubber sheet and the delay in healing of tissues cooled for some time require the stitches to be kept for a longer period.

The most important objection raised so far is that the resistance of tissue is so lowered by the prolonged cold that infection is more likely

to take place and to be more serious when it occurs after the temperature has been returned to normal. This problem is still unanswered but this may be suggested that the limbs may be kept in ice pack for a few hours or days even after the amputation of the infected part, giving the system time to remove the last remnants of the infection in the mean time from the remaining stump (if there be any infection left in the stump).

The detailed process of various regional anæsthesia can be obtained from any book on

anæsthetics.

The following is the list of cases treated by

regional anæsthesia with the results:—

(a) The brachial plexus block was done by me in 3 poor risk cases for amputation of arm, two of whom lived. One case is cited here.

A boy of 14 with kala-azar came with infective gangrene of the left forearm after an intravenous injection of urea stibamine in a vein over the wrist. He had high fever (103°F.) and jaundice. His pulse was feeble and 160 p.m. His blood pressure was 90/60. It took me more than 24 hours to make decision on the operation and to select the anæsthesia. At last the brachial plexus block with 40 c.c. of 2 per cent planocaine (M.&B.) was done and amputation was carried out at the middle of the arm. The boy had an uneventful recovery.

(b) Regional anæsthesia for inferior extremity was done by me in one case only. Really I meant to observe whether it was possible to do amputation of the leg by blocking so many was of traumatic nerves. This case too low condition. The gangrene $_{
m in}$ a very patient was operated on successfully. He lived for 3 days and then one night he died of a sudden attack of severe dyspnæa (pulmonary embolism) which had nothing to do with after effects of the regional anæsthesia.

SACRAL ANÆSTHESIA FOR LOWER ABDOMINAL AND PERINEAL SURGERY

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Though ignored and treated with perhaps a passing thought, bordering wellnigh on contempt, this unique technique affords a most safe and efficient way of producing anæsthesia, for all abdominal and perineal, gynæcological, rectal, urological, obstetrical and all operations on the lower extremities, to the general surgeon especially when he is short of theatre assistants. Sacral or caudal (as is sometimes termed) anæsthesia involves the introduction of a local anæsthetic solution in the sacral canal bathing the peridural space.

Development of sacral anasthesia.—In 1901, Sicard and Cathelin introduced and developed the technique of extradural injection by introduction of cocaine solution into the sacral canal. It was several years afterwards that the practical application of this method in surgery and obstetrics was found. By 1920, 4,200 cases were traced by Zwefel (1910) from literature. In 1942, the single-injection technique was replaced by the continuous form, for prolonging the anæsthesia over long periods at will, by Hingson and Southworth (1942), Southworth and Hingson (1943) and Edwards and Hingson (1943); and this feature has been employed with advantage in prolonged cases of labour. But the general belief that sacral anæsthesia is only applicable in general surgery in the continuous form is totally erroneous. It is because of this wrong belief that sacral anæsthesia has found so little recognition in general surgery. My contention is that, in an undivided dose, it is as good as, and even better than, when given in fractional doses.

Contrary to common belief, sacral anæsthesia does produce paralysis of the abdominal muscles, and the subsequent relaxation attending spinal anæsthesia. Thus it has all the advantages of the spinal, and none of the disadvantages. It is in fact by far the best, simplest and easiest, when the technique is thoroughly mastered, of all the known methods of anæsthesia. It is applicable to operations and painful conditions below the costal margin. Its superiority over the spinal anæsthesia lies chiefly in the fact that there is no vasomotor collapse, and thus no change in the patient's blood pressure. Its advantage over other forms of regional anæsthesia declares itself by the fact that with a single needle insertion it produces bilateral anæsthesia which can be induced at will to any level desired. Moreover, the duration of anæsthesia is the same and at times more than in spinal anæsthesia. Again one does not need an additional anæstletist to remain constantly with the patient, observing the blood pressure from time to time. The absence of nausea and vomiting and the almost complete freedom from the care of looking to the patient's general condition from time to time, makes the sacral anæsthesia by far the best of the lot. Again it should be emphasized that with the sacral anæsthesia there are no injurious metabolic or protoplasmic changes. Referring to both sacral and trans-sacral analgesia, Lundy (1942) says: 'Sacral block is one of the most satisfactory methods available to the anæsthetist in the whole field of anæsthesia. It is difficult only for those who will not take the trouble to train themselves in the technique. The argument usually advanced against sacral block is that it is not only difficult but time-consuming. On the whole in my experience this has not been true except for the beginner or the untrained'.

I have employed this mode of anæsthesia in more than 400 cases up to date, since 1941, with

singular success, and without a single mishap. The various abdominal operations that have been performed with the aid of this anæsthesia, range from simple appendectomy to complicated prostatectomy. An instance will demonstrate its excellent usefulness, and will impress its simplicity and efficiency.

A woman, aged 35 years, was admitted to the hospital for cæsarean section. She had a distorted pelvis, which was also narrow and a normal delivery of a living child was impossible. She had had several pregnancies but every time forceps had to be applied, and child delivered after perforation of its cranium. This time cæsarean section was advised by us, and she was asked to come into the hospital during the 9th month of her term. She also had a big ventral hernia. She was operated upon under sacral anæsthesia. The incision extended from the symphysis pubis to 13 inches above the umbilieus. A normal healthy baby boy was delivered none the worse for the sacral anæsthesia to the mother. Her appendix was removed and the fallopian tubes were ligated to do away with further pregnancies. The ventral hernia was also repaired. All this took us about 13 hours. The patient had no pain whatsoever: no ether or other general or local anæsthesia had to be administered during the operation. This shows the perfect result that can be obtained with the sacral anæsthesia. In time one acquires the knack of choosing the perfect subjects for it. All the cases that I have had so far were adults, from the age of 15 years upwards. I have given sacral anæsthesia to an old gentleman who was more than 80 years old. We removed his prostate.

Pre-operative medication.—The patient is given a sod. bicarb enema two hours prior to operation and one injection of hyoscyamine hydrobrom gr. 1/200, atropine sulph gr. 1/150, and morphine sulph gr. \(\frac{1}{4}\), or according to the patient's age and general condition, half an hour before the operation. This is important.

Pre-operative scrubbing.—The sterilization of the skin must be perfect, or the danger of an abscess or an infection would be very great, where a needle passed through a skin which has a trace of bacteria on its surface. The back of the patient, from the iliac crest downwards, and the area round about the anus are thoroughly cleansed with soap and hot water, all hair shaved, and the whole area wiped and swabbed with petrol. The latter thoroughly cleanses the skin and removes all natural grease and perspiration wherein it is that the germs chiefly harbour. The patient is then draped with a towel with a round hole that exposes only the area round the sacrum.

The position of the patient.—This is very important since it enables the surgeon to mark out easily the surface landmarks for the site of the injection. The patient is placed on his left side with the knees drawn close on to the abdo-

men, thereby bringing the sacrum into prominence. The surgeon stands facing the feet of the patient.

Technique. The most conspicuous landmark on the dorsal surface of the sacrum is the convex median sacral crest. This leads to the sacral hiatus. The sacral cornua then can easily be found by the index and the middle fingers of the left hand of the surgeon. A small hypodermic needle, no. 14, attached to a 2 c.c. syringe containing a 2 per cent solution of novocaine held in the right hand is then pushed exactly at the centre between the two fingers of the left hand which are resting on the sacral cornua. The needle enters the sacral hiatus striking against the bone. The solution is injected. After about 3 minutes, a lumbar puncture needle is passed at the first puncture point, being held at right angles to the skin. When it passes through the sacrococcygeal ligament, one feels as if the needle has passed through a membrane. When the needle strikes the bone, it is withdrawn 1 or 2 mm. The needle is now tilted horizontally towards the surgeon's right, and depressed for about 2 mm, through an arc at the metal collar. The needle is then thrust slowly and steadily into the sacral canal in the midline, keeping in mind that the point of the needle is directed towards the roof of the canal, since the floor is very vascular and by taking this precaution the chances of piercing a blood vessel are minimized. The needle is pushed in to about 2½ inches, and in no case, it should be pushed up above the level of the second sacral vertebra, as the puncture of the dura at this level may occur. Now a syringe is attached to the needle, and the piston drawn to confirm that the needle is not in a blood vessel, nor has it pierced the subarachnoid space. In the latter condition cerebrospinal fluid is sucked up into the syringe. Then slowly the required volume of the anæsthetic solution is injected, and occasionally the piston withdrawn to see that no blood is sucked up. As soon as the required quantity is injected, the patient is put supine on his back. The anæsthetic now begins to act. The patient feels numbness in his legs and tingling in the medial sides of his thighs. He experiences a sense of fullness and discomfort in both legs. After about 20 minutes the anæsthesia is complete. The level reached is almost above the umbilicus. The level of the anæsthesia is largely dependent upon the quantity of the fluid injected. This has been confirmed by the statements of Sicard (1901), Cathelin (1903), Grodinsky and Best (1929) and Shaw (1926). It has also been found that when a total volume is administered in divided doses, the level does not extend as high as when it has been given in a single dose. Again the influence of gravity and the rate of injection also play important parts in the height of the anæsthesia. As far as gravity is concerned, the anæsthesia is found to be more profound on the side of the decubitus of the patient during anæsthetic injection.

The solution is a sterilized solution of novocaine 2 per cent in distilled water. To this I add invariably just before the injection 10 drops of adrenaline hydrochloride 1:1,000. The quantities are:—

(1) 20 c.cm.—For all operations on the perineum, circumcision, small hydroceles, removal of hæmorrhoids, cervical repairs, dilatation of

cervix, colporrhaphy.

(2) 30 c.cm.—For larger sized hydroceles, scrotal operations, operations on penis and vagina, D. & C., lithotrity, amputations of the lower limbs, and all other operations on them which require longer time. For castration it should be remembered that while most of the genital and lower urinary structures derive their nerve supply from the sacral segments (sensory), the testicles are supplied from as high as the tenth thoracic segment. Anæsthesia on the abdominal wall must therefore reach the umbilicus before testicular pain is abolished.

(3) 40 c.cm.—For suprapubic and pelvic

surgery, hernia repairs, etc.

(4) 60 c.cm.—For appendectomy, resection of

large gut, hysterectomy, prostatectomy.

I firmly believe, and my belief has been amply confirmed by experience that the combination of the following three is absolutely essential for a perfect result. (1) Premedication with H.A.M. (2) Use of 2 per cent novocaine solution. (3) Addition of 10 drops of adrenaline hydrochloride. I had a notion that by putting the patient in the Trendelenburg position at various inclined planes, I could obtain a variation in the level of anæsthesia. Sometimes I succeeded, but at other times there were no definite results. There are certain dangers which are easily preventable, that one may come across in the application of sacral anæsthesia. The most important are:-

1. Massive spinal anæsthesia, which may occur if the dura is penetrated in the sacral canal.

2. Entrance of the solution in a blood vessel.

3. Infection either through the contaminated

needle or the solution, or the skin.

If massive spinal anæsthesia does occur, the most important thing is to supply pure oxygen to the patient's brain until the drug is metabolized. Drain off the C.S.F. through lumbar puncture which will hasten the recovery. When sacral anæsthesia has to be given the following should be ready at hand:—

(1) Pure oxygen. (2) A sterilized lumbar puncture needle. (3) Ampoules of ephedrine,

nikethamide, and a barbiturate.

Physiology and action of the anæsthetic.—It is known that fluids injected outside the dural sheath have no power to penetrate the meninges. The fluid we deposit in the sacral canal, passes out through the foramina, comes into contact with the nerves distal to the spinal ganglia, and thus we can presume that the anæsthetic works and acts on the nerves above the 3rd sacral nerve. The 3rd, 4th and 5th sacral nerves lie inside the sacral canal for several centimetres

distal to their ganglia, and are therefore exposed to a more rapid and intensive action of the anæsthetic. The passing of the fluid through the sacral foramina from the canal is definitely confirmed, when after injecting a certain quantity of the solution, we try to aspirate the same amount, we are unable to do so. In fact the fluid does not and cannot remain in the canal up to 60 c.cm. The canal as we have seen is closed at the upper end but is perforated by the foramina, so the fluid escapes through the latter, when the capacity of the canal is used up. Moreover, Farr (1926) demonstrated this distribution in cadavers, injected with a

radiopaque substance, by x-ray.

I believe that the autonomic nervous system plays also a very important part in that it supplies all the abdominal and pelvic viscera with branches. The anterior rami of the 3rd and 4th sacral nerves give off visceral branches which pass directly to the pelvic viscera. The nervus erigens is thus made, and these branches intermingle with the pelvic sympathetic plexus. The rectum, bladder, penis, clitoris are all supplied with the pelvic splanchnic nerves. Now the parent cells of the afferent fibres are situated in the ganglia on the posterior nerve roots of the 2nd, 3rd and 4th sacral nerves. Again the nerves supplying the abdominal muscles and skin which are derived from the lower intercostal nerves are intimately connected with the sympathetic supplying the abdominal organs, through the lower dorsal ganglia, from which the splanchnic nerves are derived. Thus we see that the most intimate connection exists between the splanchnic nerves on one hand and the somatic nerves on the other. We can trace the connection right through up to abdominal skin and muscles, also we can trace fibres from the lower dorsal and upper lumbar nerves to the inferior mesenteric ganglia from which fibres are conveyed to the pelvic viscera. The anæsthetic thus permeates the ganglia, blocking nerves from one ganglion to another, the effect reaching as far as the middle quadrants of the abdomen, and The fundaeven up to the costal margins. mental parts played by the sympathetic and the parasympathetic nerves need further and deep

Having studied the sacral anæsthesia in some details we are now in a position to judge its merits, as well as discuss its advantages and disadvantages. The advantages in general have been already stated here before. Let us now review the advantages in the application in surgery of different regions.

Obstetrics.—In cæsarean section it carries the minimal risk for the mother and child. It is indeed of great value to the mother when she is exhausted or toxæmic. Again in the presence of maternal shock, hæmorrhage, cardiac, respiratory and metabolic disease, it carries no anæsthetic hazards at all.

Gynæcology.—The muscle relaxation is per-

fectly adequate.

Proctology.-It is as satisfactory as spinal anæsthesia, and more safe. The relaxation of the anal sphineters is extreme. Lynch (1913, 1918) and McBee (1928) have obtained very

gratifying results.

General surgery.—The perfect relaxation of the muscles and the absence of any post-anasthetic complications make the sacral, anæsthesia the method of choice. In the presence of metabolic disease like diabetes, where an obligate amputation is necessary, sacral anæsthesia offers minimum risk.

Disadvantages.—These are also the causes of failure, if proper precautions are not taken to guard against them. The disadvantages are · mostly of technical variety. The chief cause lies in not following the proper technique. One may become impatient of waiting for the anæsthetic to act. Proper time must be allowed to pass before making the incision. The greatest disadvantage to certain speed-loving surgeons is the amount of time consumed before the anæsthesia works properly. This will at once disappear when the assistant starts the procedure before the scheduled time of the operation again arranging the list of operations helps a lot. If between two surgery cases that require the anæsthesia, one puts in other cases, the assistant gets time enough to inject the selected case before the surgeon is ready for it.

Anatomical variations.—Sometimes there are only four sacral vertebræ instead of the normal five. A considerable part of the posterior wall of the sacral canal may be wanting, owing to the faulty and imperfect development of the laminæ and the spinous processes. Also in fat people the injection is a difficult task, since the landmarks are obliterated. Again very nervous persons in whom the anæsthesia due to some

unknown cause fails to act.

There are no residual paralysis or even paresis, no post-operative shock, no acute dilatation of the stomach, no headache, as met with in spinal anæsthesia. There is one thing however that should be mentioned: It may produce retention of urine after the anæsthesia for some hours. It is probable that the distension of the bladder itself may produce dysfunction. Since the vesical sensation is lost during the anæsthesia, I believe that it is essential to watch the bladder and empty it before the patient leaves the theatre. This routine procedure obviates the complication. In certain cases I have administered carbachol tablets with instantaneous results. The patient in short is happy in all the three phases: before, during and after the operation,

Therapeutic uses of sacral anathesia.-There are certain conditions in which the sacral anæsthesia is unsurpassed. These are: (1) Acute thrombophlebitis of the lower extremities. Ochsner and deBakey (1940) have demonstrated the ability of sacral anæsthesia to block the sympathetic system though temporarily in the use of relieving pain in this condition. (2)

The patient is most comfortable and Sciatica. easy, and if the surgeon thinks it advisable to stretch the sciatic nerve, he can do so without the patient feeling the slightest pain, though I think the stretching is superfluous since the pressure of the anæsthetic solution in the canal is enough to stretch the nerve trunks. According to Evans (1930) the fluid injected into the canal flattens the dural sac from the posterior surface anteriorly and at the same time forces it upwards as much as 0.1 inch, meanwhile raising the spinal fluid pressure. (3) Labour. Here the labour pains are mitigated without complicating them. The anæsthesia does not in any way affect or impair the force of the uterine contraction, unless of course one tries to extend the block to the sixth thoracic nerve. The solution in these cases, which I employ, is 0.5 per cent novocaine solution up to 50 c.cm. for all the abovementioned conditions. I have obtained excellent

In the end I would emphasize its unique importance, simplicity, marvellous efficiency and the total absence of any complication whatsoever to those surgeons who are short of proper assistants and yet want to do surgery under perfect anæsthesia. Finally, there are certain guiding points which, if remembered, will minimize the chances of failure :-

1. If the novocaine solution is injected properly into the sacral canal, the symptoms of the onset of anæsthesia follow in about 10 minutes.

2. There is a palpable swelling outside the sacrum if the needle is not in the canal.

3. Blood is sucked up if the needle is in a blood vessel.

4. Cerebrospinal fluid is sucked up in the syringe if the needle penetrates the dura.

The patient acquires immediately a considerable anæsthesia in the lower extremities, and if the fluid has been injected quickly, the patient may get anoxia.

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PREVENTION OF CRUELTY TO ANIMALS

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LIVESTOCK occupies a key position and plays a predominant part in human economy. It provides man with milk and meat, clothing for protection, manure for fields and power for tillage and locomotion, besides supplying numerous highly efficacious therapeutic agents and biologics. In short, animal kingdom supports human life in most of its aspects and has helped man throughout the centuries to break up the old brutal way of life. The welfare of livestock is, therefore, the concern of all thinking individuals, not only on general principles of humanitarianism, but also from the utilitarian point of view.

Since times immemorial all over the world numerous agencies have been at work to mitigate the miseries and sufferings of the livestock. Religion has advocated kindness, the law has prohibited cruelties and humane societies have come to the rescue of oppressed and maltreated animals. But these agencies tackle the relatively few cruelties inflicted by brutal and careless persons. Dr. Maurice C. Hall has rightly remarked that against the large bodies of cruelties inflicted by the nature in the form of disease and suffering stand the great groups of veterinarians and scientists, who oppose nature's array of hostile forces, when these (forces) are directed against man's domesticated animals, his game and game birds, and his fur bearers, fish and other useful animals.

Diseases as cruelties for livestock.*—To the simple mind of the humanitarian, an outstanding piece of cruelty is a lathi blow on the back of a cow, or a kick inflicted on a dog. No doubt, animals must be protected from such cruelties and those who inflict them must stand condemned. But the keen observing eye of the scientist sees much more widespread suffering and cruelty for the livestock at the hands of nature in the form of disease, as compared to the small bodies of cruelties inflicted by careless or brutal persons. The diseases from which

animals suffer are innumerable, the symptoms exhibited are varied and at times extremely painful. It is a terrible thing to suffer the fever and pain of rinderpest or the agony of hæmorrhagic septicæmia, or to have the painful death of rabies, tetanus or glanders.

To save the livestock from the agonies and pains that nature inflicts on them in the form of disease, the veterinarians and the scientists are working incessantly in the field and the laboratoriest. Every other day new biologicals are being found and new weapons are being developed to attack viruses, bacteria, parasites and other agents, which cruel death and disease marshal against animals. In this noble, uphill and arduous task, many research workers have . even lost their lives, some have contracted the disease they were investigating, and some have become completely disabled and crippled. These are the scientists who have forged weapons to fight against rinderpest, anthrax, black-quarter, hæmorrhagic septicæmia, surra and against numerous other dreadful diseases and maladies, and have thus served millions of animals and earned their gratitude. Undoubtedly, the veterinarians and the scientists have played a heroic part in alleviating the miseries and sufferings of the livestock by controlling many of the epidemics, which hitherto used to sweep

Nutritional starvation.—The deplorably undernourished condition of the large proportion of the livestock in India is reflected in their sunken eyes, arched backs, hide-bound and emaciated condition and half-filled bellies, as though they are under some perpetual cruelty and are crying for mercy. This deterioration in their condition is primarily attributable to both the quantitative and qualitative shortage of food, for, as remarked by Eastern Economist, 'Starvation is perhaps the greatest single matter in the causation of our cattle degeneracy'. As matters stand at present, not more than 60 per cent of the fodder required is available and only 4th of the total concentrates needed can be obtained. On account of the shortage of fodder, the livestock of our country has to depend almost entirely on the scanty grazing available, the residues of human food crops and the small amount of cotton seed, oil cakes and the concentrate feeds. This shortage cannot be met with by importation, as this presents numerous difficulties due to bulk and high transport charges. Efforts will, therefore, have to be made to increase the productive capacity of the

^{*}Many regard it preposterous to sit on judgment on acts of Providence in order to categorize such acts as malevolent or benevolent and they take the statements of thosef who attribute some cruelties to nature, too, as little more than poetic expressions. However, the author cannot possibly subscribe to this fatalistic and esoteric doctrine.—J. M. L.

infection of animals as acts of cruelties perpetuated by scientists, but in the opinion of the author, without the adoption of these experimental methods, both medical and veterinary sciences would become speedily unproductive and cease in large measure to deserve the appellation of 'beneficient sciences'. In any case the kind of violence involved in these methods has its genesis not in himsa, but in its very antithesis, namely, in compassion for man and animals and is not, therefore, tentrary to the doctrine of ahimsa.—J. M. L.

land, so that more acreage can be spared for growing the much-required cattle feeds. Concurrently with these efforts, useless and uneconomic animals will have to be got rid of to reduce the livestock pressure, inasmuch as the present livestock strength is a very heavy stock for the land to carry'. It has been estimated that approximately 170 crores of rupees are wasted annually on the maintenance of useless livestock. Dr. Mookerji has given the following figures for the number of cattle per hundred acres of sown area in India and in other countries:-

India				67
Holland		• •	• •	38
Egypt	• •	• •	• •	25
China	• •	• •	• •	15
Japan	• •	• •	• •	6

He observes, 'It is probable that the number of working bullocks could be safely reduced in the whole of India to one-third of the present population without affecting the standard of farming and rural transport. This reduction can obviously be best achieved by removing the semi-starved uneconomic animals which consume the fodder needed for the better ones. Mahatma Gandhi has also expressed what, in essence, is a similar view in the columns of 'Young India'. 'The fact that we have more cattle than we can support is a matter for urgent treatment'. There is obviously only one method of dealing with this surplus stock, i.e. by slaughter'.* 'humane

We know that the idea of slaughter in itself is revolting to an average Indian mind and a measure of this kind would wound the religious susceptibilities of many. We will be asked, if we will not shoot human beings in similar circumstances, how can we shoot animals in the name of prevention of cruelty? Yes, we agree that men will prefer to cling to life even under more miserable conditions and will not like to have death voluntarily as a release from the sufferings. But at the same time will it be humanity to see the millions of useless, old and debilitated animals eating away the rest of the stock? Will it be humanity to allow the whole stock to degenerate on account of starvation and thus bring the agriculture of India to a standstill? No, this is no humanity; certainly this is no kindness. We shall have to put to death as painlessly as possible these useless, old and debilitated animals rather than to allow them to suffer or perhaps perish more miserably. This will be kindness and doubtless a kindness to relieve the livestock from the slow process of starvation and torture, which they are undergoing

at the moment. Besides, when once the surplus stock is got rid of, the remaining millions of animals will live in health and get enough to

So it appears that whether one likes it or not the 'humane slaughter' is the only suitable method of ridding the country of all the unwanted and unproductive stock which continue method and unproductive stock which continue to multiply and bring in more and more useless cattle to compete for the progressively diminishing fodder and grazing of the country and at the same time of relieving these miserable creatures from the pangs of hunger and starva-

Goshalas and pinjrapoles.—In India, slaughter is looked upon as an inhumane act by the majority of people, who do not like their animals to be sold to butchers, even when they have outlived their utility and it is to this sentiment that we owe the existence of goshalas These pinirapoles in this country. purely humanitarian institutions meant for sheltering old and infirm animals especially of the poor and middle-class cattle keepers and cultivators, who cannot maintain them in their helpless condition. At the time when these institutions were initiated, economic arrangements in rural and urban areas left adequate fodder resources by way of common free pastures and it was possible to maintain livestock without entailing any economic loss. But in course of time with economic and industrial developments of the country and the increasing population of cities and towns, the old economic order has changed and free pastures, and waste lands have been utilized for agriculture and industrial concerns. This has adversely affected the livestock keepers and they find it difficult to maintain their animals (Proceedings of Fifth Animal Husbandry Wing Meeting). So pressure on goshalas and pinjrapoles has enormously increased and in fact they have lost their own balance. Herefrom dates the decline phase of these institutions and their present condition is really horrible. To-day they lack in efficient management and are based on vested interests and are a complete failure for the objective with which they were started. They have become a source of cruelty to the liveinstead of being their sanctuaries. stock Animals here are much neglected their condition is often pitiable. In view of their insanitary condition, goshalas and pinjrapoles have become a nucleus of dissemination of diseases. In short, most of these goshalas and pinjrapoles have become torture houses for animals. At the instance of the Cattle Utilization Adviser to the Government of India, attempts are being made to revive and run these institutions on their ancient principles and to convert them to organizations for bullock power and dairy industry. This badly needed step is expected to go a long way in relieving the present agony of the poor creatures.

^{*}Some of the recommendations made in the note, such as the 'humane slaughter' of animals may seem difficult to reconcile with the tenets preached by the apostle of non-violence whose death it is the object of this number of the journal to commemorate, but it is only given to man, within the limits of established ethical code and social practices to formulate measures approximating these tenets.—J. M. L.

Slaughter houses.—The conditions prevailing in most slaughter houses in India are appalling and meat is produced by methods which are most inhumane and barbarous. The treatment, which the poor animals receive in the lairages, where hundreds of them awaiting slaughter are huddled together, is awful. The buildings are often dark, ill-ventilated, dirty and cramped and so badly designed that those in the waiting pens have a full view of all that goes on inside and thus must suffer horrible mental agony. Over and above all this, a great amount of cruelty is occasioned by lack of skill on the part of the butchers, who do not receive any systematic training for their work, before becoming professionals. A boy still in his teens, enters the slaughter house and starts using the knife in the most clumsy manner first on sheep and goats and then on cows and buffaloes. The poor creatures, placed at the mercy of these incompetent and clumsy butchers, suffer horrible torment before they breathe their last.

It is a curious fact that we, who have an almost universal reputation for love of animals and hatred of cruelty, should be lamentably behind other countries in the introduction of up-to-date methods of slaughter. Perhaps this can be attributed to the attitude of so many of our countrymen that when there is so much inevitable cruelty in turning livestock into butcher's meat, it is merely 'tinkering with the job ' to try to improve the slaughter houses. But, when one compares the calm and quiet which is evident in modern slaughter houses with the horrible conditions seen in those, where animals are destroyed by old traditional methods, one is convinced that slaughter reform is well worth fighting for.

No doubt, the difficulties in the way of those, who would embrace this noble, but strictly practical cause, will be enormous. On one hand they will have to make great efforts to remove the religious prejudices of the public and on the other to educate in modern technique those who are charged with the duty of slaughtering. As the methods of slaughter in our country depend so largely upon religious customs, it may not be, perhaps, possible to bring the people as a whole to such a pitch that we might be able to introduce modern scientific methods of slaughter. But with proper education, it is certain that it will be possible to effect some improvement in the old and traditional methods of slaughter and to secure better treatment for the animals.

Whatever method of slaughter may be adopted, the object should be to effect a quicker death of the animal with the infliction of the least possible pain, while ensuring the keeping quality of the meat. Various methods of slaughter, which are being practised in the different parts of the world, may be broadly classified as:—

(a) Simple blood letting by puncture of the thorax or cutting the threat.

- (b) Killing by pithing or injury to the medulla followed by bleeding.
- (c) Blood letting after stunning with a hammer, mallet or club.
 - (d) Blood letting after shooting.
- (e) Blood letting after stunning or killing the animal by electricity.

It will be readily admitted that it is more humane to destroy the consciousness of the animals before carrying out the bleeding operation. What method of stunning should be is of secondary importance, provided that (1) it can render the animal unconscious immediately and (2) it can be easily performed. The Admiralty Committee on the Humane Slaughtering of Animals, which met in 1904, gave as its first general recommendation:—

'That all animals without exception should be stunned or otherwise rendered unconscious before blood is drawn'.

While some of our countrymen may be prepared to stun their animals before actual slaughter, there will be a very large number, who will be absolutely opposed to any change from the old traditional methods and, perhaps, it will not be possible to carry them along with us. We may, however, convince them that our object is not to injure the religious susceptibilities of any, but to give the benefits of modern inventions to our dumb friends.

The Royal Society for the Prevention of Cruelty to Animals has carried out a vigorous campaign during the past 50 years or so to bring home to the public the unnecessary cruelty and suffering, which the old traditional methods of slaughter perpetrate upon the poor beasts. But, in India the old clumsy methods of the eighteenth century are being employed and the animals are not usually stunned before being bled. Can we justify the existence of this state of affairs?

'The R.S.P.C.A. represents that stunning is the only known practical method of producing insensitiveness to pain in animals brought to slaughter and that effectual stunning acts as a perfect and instantaneous anæsthetic.' We have through the courtesy of this Society a 'Humane Killer' mainly for cattle though other animals, e.g. sheep, pigs and calves can also be easily and painlessly killed. This instrument is in general use in many Continental countries, in Scotland and in many parts of England, Wales and Ireland.

The Humane Killer of R.S.P.C.A. consists of a short revolver barrel, placed at right angles at the end of a wooden shaft. By the use of this instrument the blow, which produces unconsciousness, is delivered mechanically when the trigger is pulled or the spring tapped; and the bullet or bolt smashes through the skull, causing violent concussion of the brain, with no risk of return to consciousness.

London County Council Report. 1923

Killing by shooting is also an effective method but is not so handy. Nowadays the electrolethal system is becoming popular in some countries, but it is so elaborate that it is not practicable in most of the slaughter houses in this country. In short, whatever method is used, the guiding principle should be to stun or otherwise render unconscious all the animals before drawing the blood.

Side by side with the introduction of more humane methods of slaughter, we shall also have to improve the building of the slaughter houses. The best design of slaughter house known to the author is the one recommended by the Admiralty

Committee.

It is as follows:—
(a) 'The animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughter house itself.

(b) With this object in view, the waiting pens should be separated from the slaughter chamber and the latter should be shut off by

sliding doors.

It is also of great importance that the pitch of the floor and the drainage of the slaughter chamber should be away from, and not run into, the waiting pens, as is often the case at present. The common practice of depositing blood barrels, freshly removed hides or refuse from the slaughter house in close proximity to the waiting pens should also be prohibited.

(c) It is important that the floor of the slaughter chamber, whilst necessarily impervi-

ous, should not be slippery.

(d) Cattle (animals) should, when possible, be slaughtered screened off from their fellows.

(e) Immediately after the carcases have been bled they should be moved on to and "dressed" in an adjoining room, screened off from the view of animals entering the slaughter chamber'.

But this is not all, we must endeavour to infuse into our butchers the spirit of the inscription, which appears over the entrance of a big

German abattoir:-

'Thine is a task of blood-Discharge that task with mercy, Let thy victim know no pain But let the sudden blow bring death, Such death as thou thyself would ask'.

Malpractices resorted to by quacks and brutal persons.-Where there are such humanitarian organizations, e.g. goshalas and pinjrapoles started on such high and lofty principles (no matter to which position these have been degraded to-day), and where the cattle are held in such veneration and the cow is called 'mother', it passes one's comprehension, why ever the necessity of enacting legislation for prevention of cruelty to animals was felt in this land, but the fact is that 'in spite of our boasted spirituality, we are sadly backward in point of humanity to our livestock, and so the law has to intervene to prevent sufferings to animals at

the hands of careless and brutal persons and the quacks who play havoc with the lives of the

poor creatures.

The physical tortures inflicted by man on animals are amazing both in their variety and in the extent to which they have received recognition from stock owners as effective methods for dealing with these dumb creatures. To the simple mind of a priest, even the blow of a whip on a horse may be a piece of cruelty that calls to heaven for intervention. But such act, when meted out to a restive animal, may be aligned with use of a cane as a corrective for a recalcitrant youth. It can, however, be hardly designated as other than stark cruelty when, as is commonly observed, a half-starved draught animal is being unremittingly beaten by its driver to carry a load far in excess of its normal carrying capacity. Some of the other and far more heinous forms of eruelty perpetuated on animals are listed below :-

1. Firing by quacks.—Firing is sometimes resorted to as counter-irritant for therapeutic purposes, and should be performed under strict surgical precautions, the animal being given adequate rest after the operation. It is, however, carried out by quacks in an utterly unscientific manner, which entails a great suffering to the animal. Crude methods of branding may also be referred to here as being equally condemn-

able.

Flaying of goats alive.—The skin stripped from a living goat can be stretched to a larger size and, therefore, fetches a higher price than the one removed after killing. Sometimes people out of mercenary motives commit this gross act

of inhumanity on animals.

Castration.—Castration is one of the common operations in veterinary practice and is essential for livestock improvement in rendering the scrub bulls infertile. This is done by 'Burdizzo' castrator. But in some parts of the country quacks perform this operation by crushing the spermatic cord between two fairly large stones. At times the animals die on the spot due to the blow on testicles, but generally it is associated with inflammation of the cord which favours infection and fibrosis.

4. Phuka.—This malpractice consists in blowing air inside the uterus of the heifer after This causes irritation of the uterus resulting in an increased flow of milk for a transitory period. But the yield goes abnormally down afterwards and the animal is rendered sterile due to ballooning of the uterus. A much more painful method often adopted consists in thrusting a stick wound up with a bundle of rough straw into the vagina of the cow and twisting it to produce irritation. This method also eventually makes the animal sterile.

5. Malicious poisoning.—Cases of such poisoning are not uncommon, various methods are being adopted for administering the poisons. A notorious method is the so-called 'ratti' or 'sui' poisoning carried out maliciously

or for obtaining the hide. A needle coated with the dried up paste of Abrus precatorius is pushed into the muscles of the animal which as a result develops toxic symptoms and eventually succumbs.

In the present situation, the prevention of cruelty to animals is an arduous task. The outlook of the masses has to be changed, so that they can view the livestock problems realistically bereft of emotional, religious or sentimental biases. Religious prejudices have to be cast off in the greater interest of humanity and for the uplift of the down-trodden and dumb

The problem of the prevention of cruelty to animals presents diverse aspects and can be classified under three broad heads:

1. Prevention of cruelties inflicted by man either due to carelessness or brutality.

Prevention of cruelties inflicted by nature

in the form of death and disease.

Prevention of cruelties perpetuated on animals by man due to religious dogmas and ignorant fanaticism.

For preventing cruelties inflicted by man either due to carelessness or brutality, legislation was enacted many years ago and organizations known as 'S. P. C. A'.s were formed in all the provinces and states. Though at places these societies are doing useful work, at others their employees are misusing their powers for filling their pockets and thus defeating the original purpose of the society. Perhaps greater success can be achieved by educating the masses and -making them realize the obligation and the debt they owe to the livestock.

To combat the cruelties inflicted by nature in the form of disease and suffering, an efficient and a regular army of veterinarians and scientists shall have to be maintained to keep a vigilant eye on the forces of nature, arrayed against livestock and for developing new weapons to fight against these plagues. More vigorous researches must be carried out to build stronger

and stronger defence.

It is perhaps most difficult to tackle the cruelties perpetuated on livestock in the name of so-called humanitarian and religious considerations; and these represent problems which baffle social and economic reformers. Earnest efforts shall, therefore, have to be made to change the mass psychology, so that every man concerned with the livestock comes to realize the miseries that confront our dumb friends to-day. A bold drive to end this misery will no doubt contribute towards a healthier and prosperous India.

HUMANE SLAUGHTER OF ANIMAL

By J. M. LAHIRI

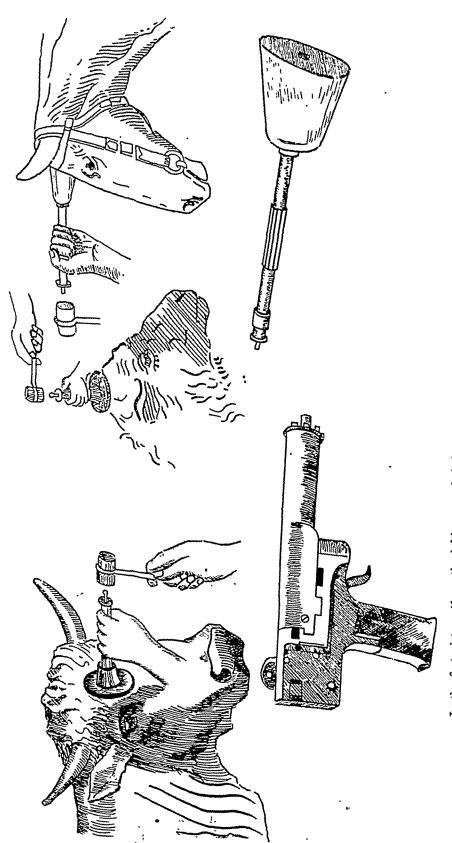
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THE campaign against butchery by cutting the throat, while the animal is conscious, has been renewed recently with the gratifying effect that newer methods, more humane in nature, have been devised. The German Society for the Protection of Animals in 1927 and the International Congress for the Protection of Animals held at Vienna decided against the procedure of 'butchery without concussion'. Many cruel customs of old times have been swept by enlightened legislation, but unfortunately, the reform in the methods of slaughtering is long overdue. We need the reform immediately and with this view in mind an attempt has been made in this article to review the whole situation with special reference to the merits and demerits of different methods of slaughtering.

The usual methods employed generally aim at obtaining the greatest possible keeping quality in meat by removing as much blood as possible by opening the large vessels of the neck, as the blood undergoes putrefaction in a comparatively shorter time. The total amount of blood in an animal body is about 1/13th of its body weight and due to the bad technique in slaughtering, some blood may remain in the body, thus affecting the keeping quality of the meat. But after efficient bleeding, the remaining amount is so slight that it cannot do any appreciable harm. So, complete bleeding and avoidance of unnecessary pain are the main considerations, upon which the merits and demerits of different

methods of slaughtering are primarily based. In the methods employed by the Jews and Mohammedans, the animal is fettered, laid down and the head is bent so that it lies on its horns and the ritual is performed by one rapid cut with a sharp long knife cutting the throat down to the vertebral column. These methods, though seemingly quite good and humane in nature, are not without flaws and call for comments which are based upon cold logic of incontrovertible facts. The object of such comments is to bring home a knowledge of the cruelties involved in the methods. The Jewish method of slaughter requires free bleeding of the carcase. The animal is allowed to bleed to death while fully conscious. The extent of this period of consciousness has been the subject of detailed and careful observations. The Late Sir Michael Foster and the Late Professor Starling found that animals remained fully conscious from 5 to 30 seconds. Besides this, casting of the animal and stretching of the neck for complete exposure of the throat to the knife are painful to the extent that the poor animal suffers both physically and mentally.

Exhaustive experiments have shown that the bleeding of animals, which have been stunned before death, is as complete as the bleeding of those in which consciousness has been present. Against the Jewish method, if the animals were first stunned by means of humane killers, no objection should be raised. Much that is objectionable in this system could be removed if the Jewish authorities would only take



In the first picture (from the left), a cow is being stuanced with the humane cattle killer. In the second picture, a sheep is being stunned with the humane cattle killer. In the third picture, a horse is being stunned with Greener's humane killer. The fourth picture shows a captive bolt pistol.

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The fifth picture shows a Greener's humane killer.

advantage of improved methods of casting, such as with the help of Weinberg pen, a mechanical device which enables the bullocks to be laid upon its back without struggle.

The most convenient and humane method of slaughter is that by which concussion precedes the evacuation of blood. The methods of stunning may be performed by a blow with a club or hammer on the forehead for fracturing the frontal bone and causing cerebral concussion, with the result that rapid paralysis of the sensory and motor nerves are produced. In stunning produced by an apparatus, a bullet is driven into the brain by a short pistol loaded with powder. But as this apparatus caused serious or fatal accidents to attendants due to faulty use, it has been superseded by shot-bolt apparatus where the bullet, which is of the form of a bolt, is blown into the brain by a discharge of powder. In smaller animals, stunning may be produced by simple bolt apparatus where the bolt is operated by means of a powerful spring which is easily compressed by means of a toggle action loading frame supplied with the implement. In this type of device, as no explosives are used, there is no noise or smell. This is definitely an advantage, as the animals become less panicky. Recently, concussion by electricity has gained the field. Extensive experiments should be made to find out the merits and demerits of this method.

Among other methods of slaughtering may be mentioned 'sticking' or 'spearing'. It causes thoracic bleeding and is the usual method of slaughtering pigs in which they are speared in the chest. This is an inhumane method of killing the animal.

In the Hindu methods of slaughtering, the head is completely severed from the body by a single blow from a sharp heavy knife. The death is brought about instantaneously and the pain is reduced to the minimum.

In the 'pithing' method of slaughtering, a dagger-like knife is driven into the occipito-atloid space and thereby the medulla oblongata, the seat of the more important vital functions, specially the respiratory centre and the centre of the inhibitory nerves of the heart, is destroyed. Breaking of the neck by hand or by knocking with mallets at the nape of the neck in small animals, like rabbits and guineapigs, also give the same result. This practice can be considered as humane provided it is done skilfully.

Death by 'stunning' is brought about by a blow on the head dealt with a club or hammer or with a shot from a pistol. In this method, concussion of the brain or a fracture of the cranium, or disruption of the brain matter is induced by a violent blow at the back, or on the front of the head. The best and the most humane methods of slaughter are those in which animals are bled after being stunned, no matter by which method the stunning is done.

For the reasons stated above, the verdict has gone in favour of killing animals by stunning or concussion, where death precedes bleeding.

The following is a list of simple bolt apparatus employed in stunning cattle:—

- 1. 'Temple Cox' humane killer.
- 2. Cash pistol.
- 3. 'Douglas-Schermer' mechanical killing apparatus.
 - 4. 'Definite' sheep killer.
 - 5. Electrolethal stunner.
 - 6. 'Iwel' electric stunner.
 - 7. The G. R. S. A. electrical 'Coaxer'.

In horses, stunning is done by various devices including shot apparatus, bolt apparatus or shot-bolt apparatus. In concussion by 'Slaughter mask', the bolt is driven with a hammer through the skull into the brain. For this operation, 'Lut Kepel's Mask' with double bolt is employed.

A Mirror of Hospital Practice

UNWANTED MEDICAL RELIEF

By S. D. S. GREVAL

LIEUTENANT-COLONEL, late I.M.S.

Serologist to the Government of India, School of Tropical Medicine, Calcutta

The following is a typical case. After a deed of violence and a domestic tragedy the victim and family are much more concerned about the revenge than the relief. Precious hours which if availed of in seeking medical relief can save the life of the victim are spent in reporting the occurrence to the police.

"In the Court of Sessions, Ramnad Division at Madura, Monday, the 1st day of March, 1948. Sessions Case no. 4 of 1948.

Names of the accused:-

- 1. Syed Ahmed.
- 2. Abdulla.

Charges :-

- 1. Murder under section 302 I.P.C. against
- A-1.
 2. Aiding and abetting the offence of murder under section 302 read with sections 34 and 109 I.P.C. against A-2.
- 3. Voluntarily causing grievous hurt with a dangerous weapon under section 326 I.P.C. against A-2.
- 4. Voluntarily causing hurt with dangerous weapons under section 324 read with section 34 I.P.C. against A-1 and A-2.

Plea of the accused :-

'Not guilty'.

Opinion of the assessors:—
Assessors nos. 1 to 3:
Charge no. 1—A-1 guilty.
Charges nos. 2 and 3—A-2 not guilty.
Charge no. 4—A-1 and 2 not guilty.

Finding of the judge:—
A-1 is guilty under section 302 I.P.C.
A-2 is guilty under section 326 I.P.C.
They are not guilty of any other offence.

Sentence:-

A-1 is sentenced to transportation for life. A-2 is sentenced to R.I. for three years.

(A. = Accused; P. W. = Prosecution witness; M. O. = Material object—exhibit. All important occurrences in this account have been italicized by the writer.)

Judgment

This case relates to an incident in the village of Sikkal in the course of which a young woman called Mariam Bibi (deceased), her mother Ayisha Bibi (P. W. 4) and the latter's sister Kadir Bibi (P. W. 5) sustained stab injuries. Mariam Bibi died on 3rd September, 1947, as a result of the injuries. One injury on Ayisha

Bibi was found to be grievous.

2. Mahomed Ali (P. W. 3) and his wife P. W. 4 had a daughter Mariam Bibi. Some seven years back, they gave this daughter in marriage to A-2 who was a resident of the same village and was the younger brother of A-1 and a distant relative of P. W. 3. The couple lived amicably till A-2 left the village for war service about four years back. After joining the army, A-2 did not send any money at all. The deceased wrote a letter to the Officer Commanding of A-2's unit in the matter. The Officer Commanding sent money for two months on this letter. The girl lived for some time in A-2's house and then moved away to her father's house. Four months later, A-2 himself returned to the village after discharge from the army. He lived with the deceased for some ten or twenty days. But then, he seriously accused her of having caused loss of prestige and promotion to him by writing to the Commanding Officer, then ill-treated her and finally drove her out of his house. The girl took refuge in her father's house. Subsequent to that, a child was born to her. The child died (the deceased had already borne two children to A-2; those children also had died). About two months later, the father of the accused 1 and 2 came from Penang and asked A-2 to take back his wife, but A-2 refused saying that he did not require the deceased. A-2 wanted to obtain a divorce and approached the mosque panchayat consisting of seven permanent panchayatdars including P. W. 9. He paid a fee of six annas and mentioned his complaint as against his wife and asked for the relief of divorce after duly holding a panchayat. The panchayatdars sent word to P. W. 3 who also deposited the fee of six annas and willingly agreed to the arbitration and decision. After

giving an adjournment, the panchayatdars obtained muchlikas from A-2 and P. W. 3 agreeing to be bound by the decision of the panchayat. On the next day of hearing, the two men put in their respective pleas in writing. The statement of pleadings of A-2 is Ex. D-6 and is to the following effect. A-2 had been sending money regularly to his wife but all the same the latter had put in a false complaint to the Commanding Officer, thereby causing loss of prestige as well as his discharge from the army. A-2 wanted an account from her for the moneys received by her. He and others had foiled an attempt by the deceased to commit suicide by drinking the juice of the Madar plant. P. W. 3's statement of pleadings is Ex. P-11. Therein, he claimed several sums due to him from A-2 as condition precedent for the divorce, including the cost of having maintained the deceased in the absence of A-2, and costs incurred in connection with the deceased's confinement, etc. P. W. 9 says that the sum claimed by P. W. 3 amounted in all to Rs. 365. Incidentally a sum of Rs. 90 had passed from A-1 to P. W. 3 about seven years back, in connection with the marriage of A-2 and the deceased. A-1 had been demanding the amount from the time of his arrival from Penang. P. W. 3 had sent reply (through others), pointing out that money was due to him regarding the mahar of deceased, etc., and that the panchayat was pending, and that he would make payment after the accounts were finally settled. By the time the pleadings were filed, the holy month of Ramzan had set in. P. W. 9 and other panchayatdars adjourned the final hearing to 12th September, 1947. No such panchayat was held, for, by that time, the occurrence of this case took place, and the deceased was dead.

3. The following is the version of the 17 P. W.s regarding the occurrence on 2nd September, 1947. On Tuesday, 2nd September, 1947, the deceased went to the fresh water well in the kannoi about 2 furlongs to the north of the village and a house. She returned with the pot of water. When she reached a big stone block (kuthukal) about ten yards to the north of the village, A-1 came before her, obstructed her, abused her in vulgar language and assaulted her. He advanced to beat her. The deceased remonstrated. At that time, a local Muslim, P. W. 14, happened to come there. The latter intervened and reprimanded him for his improper conduct towards a young woman and made him go away from the deceased. The deceased went with the pot of water to her house. She laid the pot down. She told her mother P. W. 4 and the latter's sister P. W. 5 (who was also in the house) about what had happened, and the improper conduct of A-1 with her (the deceased) and the intervention of P. W. 14. The deceased then went out of the house on to the front pial, sat down there, and gave vent to her pent-up feelings by a volley of abuse regarding her having been

harassed. Just then, A-1 turned up suddenly with a spear blade, grasped by its stump in his right hand. A-2 also came with him, and just behind him, with another similar spear blade in his hand. A-1 then went up to the deceased and said, 'The money due to you and the money due by your father cancel each other. Your life ends with this. Come to the mosque for talak'. So saying, he caught the deceased's hand with his left hand and dragged her. The deceased knocked aside his grasping hand, raised her own hand freely and said, 'Why should I come with you for pronouncing talak? Are you my husband? Let my husband call me for talak. I will come then'., A-1 at once stabbed the deceased on the forehead with the spear blade and then quickly followed it up with another stab on the left flank. The deceased dropped down. P. W.s 4 and 5 were seeing this from inside the house just beyond the threshold at very close quarters. P. W. 4 rushed out saying 'Did I give (her) in marriage be murdered like this? (You) murdered her like this'. A-2 who was standing by the side of A-1 immediately stabbed P. W. 4 on the left forearm, and on the left side of her chest. P. W. 4 pressed her arm against the chest wound and stooped. P. W. 5 then came running up and said, 'You villains, you have committed two murders like this'. P. W. 5 also stooped to attend to P. W. 4. A-1 then stabbed P. W. 5 on the back with his knife. The two accused ran away with their knives southwards. The three injured Finding that women wept for some time. nobody came to help them, they proceeded southwards with a view to go and complain at the local police station. But after walking 300 feet, they came in front of the house of P. W. 3's sister Ameena P. W. 13. Then the women felt exhausted and went to take some rest. P. W.s 4 and 5 climbed on to the pial. But the deceased could not climb the stone door step M.O. 8. She sank down and rested her head and reclined on the stone wetting it with her blood. P. W. 13 ascertained from them what had happened. Though she questioned the deceased alone, not only the deceased but also P. W.s 4 and 5 told her (P. W. 13) what had happened. P. W. 13 woke up her young son P. W. 8 who was sleeping inside the house and sent the boy to fetch P. W. 3. The latter found P. W. 3 in the bazaar street and fetched him.

4. P. W. 6 is a boy of Ervadi, four miles from Sikkal. On 1st September, 1947, he had come to visit his relative Abdul Karim who was living about 25 feet from the house of P. W. 3. At about 3 p.m., this boy (18 years of age) was talking to Abdul Karim's wife inside her house and taking leave of her. Just then, he heard the noise and went to the house of P. W. 3. He saw the whole occurrence from the time A-1 caught hold of the deceased by the hand and dragged her. P. W. 7 is another young lad who is residing four or five houses to the north of P. W. 3's

house. At about 3 p.m. on Tuesday he was going along the street to the bazaar. When he was at a distance of about 20 or 25 feet from the house of the deceased, he heard the noise from the house of P. W. 3. He then saw A-1 and 2 standing in the front portion of the house, the deceased lying on the ground and P. W. 4 crying and shouting that her daughter had been murdered. He then saw A-2 stabbing P. W. 4 and the subsequent events including the stabbing of P. W. 5 by A-1, and the running away of both the accused and the three women going southwards along the street. P. W. 7 went away to the bazaar. P. W. 6 says that he, P. W. 7 and Ibramsa went along with the three injured women. (P. W. 7 does not refer to P. W. 6 or Ibramsa; P. W. 4 does not refer to P. W.s 6, 7 or Ibramsa, but P. W. 5 speaks to having seen these people as present and helplessly looking on as the accused were stabbing with knives.) The accused and particularly A-2 are all well-built men whereas P. W. 6 is a weak young lad and P. W. 7 is also small and was inferior in strength and build to the accused though not exactly weak. P. W. 6 did not go to his village that night. He stayed on in Sikkal.

P. W. 3 brought two carts and put the deceased in one cart (a cart with a hood) and P. W.s 4 and 5 in an open cart (hoodless fresh cart) and took them to the house of the village munsif P. W. 10. The village munsif saw these injured women, questioned them, learnt from them what had happened and then went to his house and recorded a complaint from P. W. 3. This complaint is Ex. P. 9 (a). At that time, P. W. 9 was also present, having come there on hearing about the occurrence. The three women were then taken to the local police station. The Head Constable P. W. 11 received the report and complaint from the village munsif. As he found the condition of the deceased precarious, he recorded a dying declaration Ex. P-10 from her in the presence of P. W.s 9 and 10 whom he had sent for. He registered a crime under section 326 I.P.C. and examined P. W.s 3 to 5 and sent the three women to the hospital at Keelakarai, ten miles off for treatment. P. W. 11 then went to the scene of occurrence. He seized the bloodstained stepping stone M.O. 8 by a mahazar Ex. P-4 (a), from where it was lying in front of P. W. 13's house. He searched the house of the accused whom he found to be absconding.

at about midnight on 2nd September, 1947. The lady doctor P. W. 17 examined the women and treated them. On the deceased she found three injuries described correctly in the certificate Ex. P-16. No. 3 was a contusion on the left shoulder alleged (by the deceased) to have been caused by fisting. No. 1 was a gaping incised wound between the 9th and 10th ribs. On the left anterior axillary line, omentum of the size of a lime fruit was protruding through

the opening. The second injury was an incised wound in front of the right ear on the right side of the head. The deceased said that these two injuries were caused with a vel knife and no. 3 by fisting at about 4 p.m. that day (2nd September, 1947). On P. W. 4, the doctor found two incised wounds described in the certificate Ex. P-17. No. 2 was on the left forearm and simple. No. 1 was an incised wound $2\frac{1}{2}$ inches by 1 inch and on the upper part of the left anterior axillary line in the flank. Air was escaping through this injury while breathing. So it endangered life and was grievous. On P. W. 5, the doctor found a single simple incised wound on the lower part of the back of the right side of the chest described in the certificate Ex. P-18. P. W.s 4 and 5 said that the injuries had been caused at about 4 p.m. with vel knife on 2nd September, 1947; they could have been caused at that time and in that manner. P. W. 17 gave morphia and operated on the deceased and stitched the wound in the flank. This did not save her.

7. The deceased died on 3rd September, 1947, at 5 p.m. The lady doctor P. W. 17 sent intimation Ex. P-14 about the death to the local police station. The Head Constable of Keelakarai P. W. 15 then registered it as crime, then went to the hospital and held the inquest examining P. W.s 3 to 5. He then sent express reports to Sikkal police station. He sent the corpse through a constable P. W. 2 to the lady doctor P. W. 17 for post-mortem examination.

- 8. At 7 a.m. on 4th September, 1947, the lady doctor P. W. 17 held the post-mortem examination over the corpse of the deceased. Underneath the injury in the flank, which she has described as no. 1 in Ex. P-16, she found considerable damage. The tenth rib was found cut at the cartilaginous end. An injury went inwards and cut all the layers of the anterior wall of the stomach obliquely causing a rent about 1½ inches in length. The injury had caused death by shock and peritonitis; it was sufficient in the ordinary course of nature to cause death. Ex. P-19 is the post-mortem certificate.
- 11. On analysis, M.O.s 1 to 8 were found to be stained with human blood as seen from the report Ex. P-7 from the Chemical Examiner and Ex. P-8 from the Imperial Serologist which are proved by P. W. 1, then clerk of the Additional Sub-Magistrate, Mudukulathur.
- 16. I find no room to doubt the prosecution evidence of P. W.s 4 and 5, that A-2 was present at the scene of offence and took part in it. I find as follows regarding the several charges.
- 22. A-1 caused only two injuries to the deceased. The injury which he first caused is simple. The second one is a fatal injury. He did not continue to attack her after she fell down. In the dying declaration deceased had said that at the time of causing the injury A-1 said 'with this, your span of life closes'. P. W. 5 also mentions in this court that A-1 said like that.

But she did not say this either in the committing court or when examined by the Magistrate under section 164 CrP.C. P. W. 4 also did not mention it in her statement under section 164 Cr.P.C. In her deposition in the committing court also (Ex. D-1) her statement appears that her (decensed's) account was come to a close. It can be interpreted as a settlement of account by set off of money due by P. W. 3 against money due for mahar. There is some room for doubt as to whether A-1 said as alleged in Ex. P-10. In any case, his intention to cause that bodily injury as would in all probability cause death has to be inferred from his action. But it cannot be said that he had the deliberate intention of killing the deceased from the beginning. Probably he felt the humiliation and disgrace of being abused by P. W. 1 openly in the street within the hearing of all neighbours in broad day light and therefore he came with A-2 to take away P. W. 1 on the ostensible ground of pronouncing talak but with a view to put an end to the abuse. When the deceased replied in sharp language challenging his right to pronounce talak, he felt still more infuriated and stabbed. I consider that, in the circumstances, it is sufficient that lesser sentence of transportation for life is sufficient, though A-1's prior conduct was the cause and occasion for deceased abusing him. I accordingly sentence A-1 to transportation for life."

The deceased was stabbed during the day; she spent the rest of the day and part of the evening in lodging complaints; she did not arrive at the hospital before midnight; and she died the next day. That she was severely injured 'murdered', was well known to all concerned.

The account, further, gives fees, etc., payable for transactions affecting a woman's life. The whole case is a composite picture of the life of a community in rural Southern India.

Occasional Notes

THE IRRESISTIBLE IMPULSE

By D. RAGHAVA RAU Nellore, S. India

THE call by the Editor of the I.M.G. to contribute to the Special Tragedy Number on any of the 18 subjects which mitigate suffering and thus would have found favour with the Mahatma is admirably conceived, appropriate and 'irresistible.'

An irresistible impulse may be defined as sudden eruption of an idea on to the conscious level with a compulsive tendency to precipitate action.

The mere mention of the word 'irresistible' wakes up a series of associations in every mind with drink, debauchery, and diabolic crime.

In fact, a host of acts which are (in textbooks on abnormal psychology) described as 'manis' and many other compulsive acts, all come under irresistible impulse. These irresistible impulses may be comic or tragic. They may be interesting, excite our mirth and may indifferently be passed over; or they may be harmful to oneself or to others and entail grave danger to person or property. Amongst the former, an impulse to count anything from steps on the staircase to lamp posts on the road and even corporation dustbins is comic indeed. Less comic is the impulse to cough in congregation and specially at music parties. More serious is the impulse to swear aside in churches, specially at masses and tendency to micturate in congregation. Periodic craving to drink, an impulse to steal, etc., are all serious disorders and the most tragic of all is an impulse to mutilate and to set fire to anything from new clothing in the wardrobe to the hay-stacks on the countryside. These are tragic indeed.

An irresistible impulse when present on the conscious plane is shrouded in anxiety. Another element to be noted is the compulsive nature of this anxiety. When the anxiety liquidates itself in precipitate action the person feels immensely relieved, be it theft, drink or murder. The facts to be noted in the working of this impulse are anxiety, the suddenness and helplessly compulsive nature of it. Lastly, the person feels greatly relieved, becomes placid and cheerful after the liquidation of the impulse in action. Impulses with varying degrees of irresistibility and compulsiveness are associated with tics and mannerisms.

All these, when subjected to prolonged analysis—autognosis—and re-education, may be brought under control and finally liquidated. The procedure involves in the early stages, psychic pain, frustration, anxiety and disappointment, so that the impulse is irresistible only apparently and may subsequently be brought under control.

Apart from all these abnormal impulses, there arises from the depths of the unconscious, sometimes an impulse very irresistible indeed and hopelessly compulsive in nature—that is the impulse to submit; impulse to feel prostrate and to pray, in some moments of distress and doubt. It has been my lot very often to see (at the critical acme in mental disorders, when a change for the better is near) patients with this very compulsive impulse to stand in awe, weep and pray. It seems to me that when the spirit in man is stirred to its depths and when the stir overwhelms the mind, there is always the impulse he:plessly to submit. The mind feels the absolute necessity to submit to a power higher than itself; it feels desolate in its own accustomed abode. It seeks freedom in the expensive self higher and larger than itself. It is in such supremely anxious moments that one feels the small self pitiably inadequate to take up the burden of the moment, it feels the

absolute necessity of liquidating itself in a larger self. When this moment of merging is near, there arises the impulse irresistibly indeed to stand aside paralysed in awe and pray, This attitude into which the individual is drifted or drifts himself defies description or classification. It is absent in many of the so-called normal individuals. It is one of the moving manifestations of the mind in the tenderhearted and deeply religious people. It is absent in those that are ritualistically inclined and denominationally describable. It is this irresistible impulse that purges the mind of its dross. It is this impulse that keeps the mind in contact with higher power and enables it to recoup itself with vitalizing energy from a reservoir larger than itself. It is this irresistible impulse that tones and tunes the mind, keeping it pointed and subtle. In short, it is the radiating energy from this impulse that enables us to pass with utter indifference over the disappointments, distress and doubts of this world, and it is this impulse that shows us always, in utter dark moments of this existence, a light and a power beyond. In fact, it is this impulse that urged and sustained great men in the bitterest agonies of their mundane existence. It is this impulse that galvanized great men into actions beyond the capacity and endurance of ordinary humans.

In brief, it is this impulse to pray and commune that enabled the Mahatma to electrify the whole country and to make it stand on its own feet as one single individual. At the command of this man under this impulse, foes vanished and an empire crumbled. When the notice to quit was given to the mightiest of modern empires people laughed. The Mahatma was classified as definitely abnormal. People realized very little of the potency of this irresistible impulse, i.e. impulse to pray. More things are wrought by prayer than this world dreams of is the belief of the great mystic poet. And we all know the great Imperial Power gracefully had to quit.

It is for the systematic cultivation of this impulse into an ever-present active spiritual state that the Mahatma conceived the idea of 'Consider prayers—Bhajan. congregational the masses, move with the multitude, pray when in doubt' are the injunctions that do not generally flow out of ordinary minds. They are the eternal truths that are the outcroppings only of men of this irresistible impulse. Deep speaks unto deep. So let us turn assiduously to a systematic cultivation of this impulse into an ever-present activity which will enable us all to achieve what the Mahatma dreamt and stood for during his earthly career, and it is this impulse that should galvanize us into action after his tragic quitting. This should enable us also completely to eliminate human suffering and materially to hasten the advent of kingdom of heaven (Rama Rajya) for which he laboured long and hard.

THE SUPERMEN

By B. BHATTACHARJYA, M.B., B.S., M.R.C.P., D.P.M. LIEUTENANT-COLONEL, I.A.M.C.

Officer Commanding, Military Hospital, St. Thomas Mount, Madras

THE first obstacle to encounter in dealing with supermen is in defining them. What kind of persons are the supermen? It is almost impossible to furnish the specifications.

Is the superman an individual showing all-round superlativeness in all the directions of human achievement, physical, ethical, intellectual, and spiritual? Is he the forerunner of the furthest evolutionary advance that the human race is capable of making? It is doubtful if any of the supermen of history will stand this test.

In every age, the common men do earnestly desire an ideal superman, and to meet this desire they magnify the best living substitute for it they can find. To the common man, the superman is at the same time an ideal fulfilled and an enigma. He appears during certain periods of human history and gives expression to the dormant aspirations of the race. As the deep fires of the earth cannot rush out everywhere in million jets but have to issue forth through a volcano, so also racial aspirations find expression only through a superman.

Few of the supermen of history were gifted from birth with special faculties: superhuman intelligence, superfine power of expression of a poet or a painter, or the insight of a prophet. Majority of them started life as common men; but being fired with *idealism* and endowed with courage, they extended their influence over the thoughts, words and actions of the race.

Let us analyse these two important qualities, idealism and courage, a little more in detail. Idealism eludes correct definition. It is a steadfast belief in some principle answering to our highest conceptions, e.g. the belief in Renunciation of Buddha, the belief in Love of Christ, the belief in Non-violence of Gandhi. To those who have felt the impact of these ideals, comes a new sense of liberty, of delight and of adventure.

Coming to the second quality, courage, it must be emphasized that it is a far sublimer courage than the courage of the indomitable will. It is the courage which yields itself to the perfectest suggestion from within; to the suggestion which transcends the individual.

The third ingredient of superman is a mystic quality, popularly known as inspiration, by reason of which quality the superman is an enigma to the common man. In a way it is good; because if a great man makes us comprehend him, we are likely to hang, crucify or shoot him.

Like the conscious and subconscious, we may postulate the presence of the supraconscious. In most men this is dormant; it is in the blessed few that this faculty has a more direct expression

than in others; these few men are aware of the deep rumblings of the creative sources of their soul. Their awareness, which may be gradual or a sudden revelation, finds form in speech, utterance and acts: they turn out to be the great prophets, the great poets, the great leaders of mankind. In the vast majority of men the rumblings are dumb, they will never come forth in expression.

In the present age, there is a conflict in the mind of the human race, due to rapid development of scientific knowledge combined with an underdevelopment of its appreciation of ethical principles. This state of affairs may apparently seem not to be favourable for the appearance of supermen. But contradictory as it may seem, this very state of affairs is conducive to the appearance of supermen. Because of this underdevelopment of ethical principles, within the innermost soul of the modern man, there is a continual aspiration to a deeper self-consciousness and a clearer self-realization. This hankering and unrest of the soul has led the people to culminate from the vast base of populace upwards, pyramid-like, through the zones of understanding and illumination, to the summit, where the greatman is alone.

To summarize, idealism is dormant in the vast majority of mankind; they lack in addition the courage to express it; hence the population is expressionless; perfect expression is only found in the supermen of the period, who have idealism, courage, and the mystic quality called inspiration, derived from an alert supraconscious.

POWER UNLIMITED

By A. T. W. SIMEONS, M.B. Bombay

Is man's hunt for power coming to an end? Is man's struggle for the mastery over his natural environment and his efforts to overcome the physical limitations of his muscles, his five senses, his memory and his mental associations drawing to a close?

Man has continued to supplement the natural powers with which he was born to such an extent that these have shrunk into insignificance. No human brain can hold the knowledge stored in a library or even in a single encyclopædia, nor can it perform the miracles smoothly and infallibly accomplished by a modern calculating machine.

Compared with the limited vision of the unaided eye, the modern camera, television, radar, the electron microscope, the Mount Wilson telescope and the x-ray tube have opened up almost inconceivable dimensions. The feeble human voice is carried round the globe and returns louder than it went. Film recording of sound and sight has softened the grim finality of the word PAST. Space and speed in space, that is time, have widened far beyond what

সমপর্যায়ে উঠিতে নিশ্চয়ই দক্ষম হইব এবং তাহাদের ন্যায় দেশের ও দশের দেবায় লাগিবার জন্য উপযুক্ত হইতে পারিব (Given adequate education and training we too will rise certainly to the same status as has been acquired by our Western brethren and serve the country and people)..... আপনার মত গুণী ও সহদয় ব্যক্তিকে বাংলাদেশ পাইয়া যেমন ধনা হইয়াছে আমরাও আজ আপনাকে আমাদের মধ্যে পাইয়া তেমনই গৌরবান্বিত বোধ করিতেছি এবং আশাপূর্ণ হৃদয়ে আপনার সমীপে আমাদের চুঃথের কথা জানাইতেছি (Blessed is Bengal by getting a sympathetic and learned man like you, so, too, do we feel glorified to have you in our midst: with hopeful and expectant heart we appeal to you for the redress of our miseries).

As remarked by His Excellency the boys and girls look particularly alert, happy and bright.

In addition to speaking, reading and writing scholars are also taught handicrafts and art. The articles of utility and ornament produced by them were also exhibited at very reasonable prices. They were in no way inferior to similar articles seen in shops. In fact they must be superior inasmuch as each was made individually and had the attention which is not given to mass produced articles.

It is estimated that in West Bengal there are about 4,000 deaf mutes of school-going age. 180 is but a small fraction of this figure.

The school has been in existence for the last 55 years and is the premier school of its kind in India. The annual recurring expenditure is of the order of Rs. 1,20,000, of which Rs. 36,000 is received as grant in aid from the Government.

The education of deaf mutes is more expensive than that of normal children because of closer personal contact between teacher and pupil.

Usually a class consists of 8 children with one teacher.

All the scholars do not come from poor homes only. Three children belong to medical men. Nor are speaking, reading and writing and handicraft the sole aims. Several boys are studying for a university degree.

No research work on the cause, heredity and psychology of deaf mutism appears to have been done in Calcutta in spite of the existence of this excellent school.

The purpose of His Excellency's visit was to receive a purse of Rs. 1,500 for the school from

Sri D. N. Mukerji of the Hooghly Bank Ltd. The money was collected 'over the counter in the half year since January last for the school'. This collection 'over the counter' for humanitarian purposes is in itself an innovation which is being fully utilized by Sri Mukerji, the Managing Director of the bank which only the other day had collected Rs. 25,000 for the proposed Cancer Institute. The bank has now launched a new drive for collection of the funds for the West Bengal Leprosy Relief Association.

Any further information concerning this excellent institution, especially with respect to research, may be obtained from the Principal, Rai Sahib A. C. Chatterji, the Honorary Secretary of the school, Mr. N. C. Paul or the Honorary Secretary of the Convention of the Teachers of the Deaf in India, Mr. N. Majumdar. The address of the school is 293, Upper Circular Road, Calcutta 9.

THE DEATH PENALTY

(Abstracted from the Lancet, ii, 24th July, 1948, p. 165) THE House of Commons on 15th July considered the Criminal Justice Bill. Sir Hartley Shawcross, Attorney-General, moved that the House should disagree with the Lords' amendment to delete Clause I (suspension of the death penalty for murder). He urged the merits of the Government's proposal to recognize two categories of murder—the capital and non-capital. He thought that juries would have no difficulty in deciding whether a murder came into one of the five classes for which capital punishment was reserved: (1) Those committed in connection with robbery, burglary, or house breaking (gangster offences); wounding by three or more persons acting together; offences committed with explosive or destructive substances; rape, indecent assault and sodomy; (2) murder of a police officer, or a civilian who was assisting a police officer in the execution of the law; (3) poisoning when the poison had been systematically administered; (4) the murder of a prison officer; and (5) second murders. Mr. Winston Churchill said that the Government's clause would weaken the jury's sense of responsibility and introduce distinctions that would puzzle and buffle them, while its inconsistencies and absurdities would tend to bring the law into disrepute. The most frequent types of murder, such as wounding, stabbing, and drowning, and the most wicked murders, would not carry the death penalty. Sir John Anderson thought the new clause was unsatisfactory because it sought to substitute a rigid and elaborate statutory code for the existing flexible, well-tried system. He thought that the words 'express malice' would give rise to serious difficulty. The only possible and sensible course for those who believed that the capital sentence was an unavoidable evil and would like to see it got rid of to the fullest possible extent and as speedily as possible, was to proceed by the exercise of the Royal prerogative.

Mr. Chuter Ede, Home Secretary, on the other hand, believed that the wider use of the Royal prerogative would involve the Home Secretary in considerable difficulties. The Government had put before the House a method by which steady amelioration of the law could be carried forward in a way that would not violently offend public opinion.

After a series of divisions, the Government's compromise clause was carried by 307 votes to 209.



Lead, Kindly Light, amid the encircling gloom, Lead Thou me on!

Indian Medical Cazette

JULY

THE TRAGEDY OF TRAGEDIES

On 30th January, 1948, at 5-5 p.m., at Delhi, in Birla House, a young man shot and killed Mahatma Gandhi. The Mahatma was about to address his usual evening prayer meeting, and the young man was one of the audience. On the altar of higher human passions has been sacrificed the greatest man of the age! A Balidan.

To gauge correctly the greatness of the Mahatma a glimpse of the background of our

history is essential.

Dess than a year ago, on 15th August, 1947, this country emerged from under a curse thousands of years old. The curse was the dry rot which had pervaded the entire social fabric of the population. The cause of the dry rot appears to have been the change from a nomadic to a static civilization. When the Central Asian tribes ceased to move in India, their chieftains became despots and tyrants and the rest serfs and sycophants. The rest included the vanquished people of the country who by waiting hand and foot on their conquerors, even as untouchables, sapped their strength and took the slaves' revenge. Old invaders could not beat new invaders and became serfs themselves. Regulations of Active Service continued into times of peace prevented the growth of democracy and produced in its place either abject cringing or latent treason. Interested or over-zealous parties added odours of sanctity and piety to the cringing of the 'miserable sinners' beloved of the East.

In the mist of antiquity are visible scenes unbelievable, unthinkable—and when divested of their mythological reverence—unworthy and unbecoming. Public opinion in public matters, which ought to have been respected, is flouted and tragedies follow. Irresponsible criticism in private matters, which ought to have been ignored, is respected and more tragedies follow. Second families raised by old despots, obviously under the urge of the usual morbidity of old age, from inferior stocks, plunge the country into civil wars and their consequences. Tradition admits that the degeneration of India dates from the civil war of the Mahabharata, a country-wide upheaval, comparable to the World War II in Europe, in its intensity and devastation. This occurred in spite of the fact that the Mahabharata gave the people the Gita.

Things go from bad to worse. The utter futility of everything at this period makes even the personalities of Buddha and Asoka appear

unreal.

Only a timely foreign invasion saved the country from total disintegration. The foreigners had hardly settled down as citizens when the curse operated again. Venturesome Afghans, the

new-citizens; murdered one another and chaose prevailed.

Another foreign invasion occurred and the same story was repeated. This time the mighty Moghuls, the latest citizens, murdered one another and chaos prevailed again.

But for the European penetration, peaceful at first, the chaos might have become chronic.

The Europeans never became citizens and they never became subject to the curse. Ultimately the British acquired the supremacy

which was ended less than a year ago.

The British banished the chaos and ruled. Almost in direct proportion to the disappearance of the chaos, however, there appeared in the ruled an inertia and a compromise with serfdom. Several worthy sons of India rose to the occasion. Gandhi rose highest. Realizing that our bane was the inequality among ourselves he strove to abolish untouchability. 'Hinduism has sinned in giving sanction to untouchability. It has degraded us, made us the pariahs of the Empire. Even the Mussalmans caught the sinful contagion from us; and in South Africa, in East Africa and in Canada, Mussalmans no less than Hindus came to be regarded as parials. All this evil has resulted from the sin of untouchability'.—Mahatma Gandhi (Mahatma Amar' Ho Gaya. Printed and published by G. P. Ganguli on behalf of Saturday Mail Publications, Calcutta, p. 8). Also realizing that we were preferring an inferior status and security to selfrespect and independence, because of possible risks, he said to the British 'Quit India and leave us to anarchy and God'. He was the father of India which assumed power in 1947.

The Naked Fakir of the Fighting Statesman had replaced the innate fear of the serfs by

soul-force.

He and others like him were not subject to the curse because in outlook they were far from static and undemocratic. Even before him, in the face of Moghul tyranny, an entirely new community with a similar outlook on life had come into being and given a very good account of itself in martyrdom, fearlessness and aid to the oppressed. Their methods, however, were not Gandhian altogether. They '... had been persecuted during the reign of Aurangzeb to such an extent that they armed themselves for protection and formed themselves into a military organization. From the Sutlei districts they advanced to Lahore and Delhi' (J. C. Allen, A Narrative of Indian History, 1943, Longman's Indian History, p. 129).

Indian History, p. 129).

Later they 'became the rulers of North-Western India and one of the greatest military organizations in the land'. (J. C. Allen, p.

205).

Elements in opposition under the British rule acquired the non-static and democratic outlook

of the rulers by the mere impact of the opposition and the inevitable infection with the latter's tradition. That taxation without representation is a tyranny, that even a king forfeits his head to his subjects and many other basic principles of democracy we learnt from the English tradition of our late rulers. Thus has the curse of dry rot been lifted.

Our present leaders are far from static in outlook. Asia looks up to them for leadership in affairs of the world. The world looked up to the

Mahatma in matters of the spirit.

That a Great Soul who had purged from his own personality all violence and hate, even in retaliation, should have been so insistent on everybody doing the same, was a tragedy. It limited his audience and thus narrowed his field of operation at a time when his guidance was most needed.

That a prophet of peace should have insisted on turning the other cheek only and not developed further the 'live and let live' sentiment inherent in every Indian, was another tragedy. The unattainable has remained unattained and the attainable has not been attempted.

That still 'it is dangerous to be too good'. after Homo sapiens has been in possession of the planet for between 25,000 and 40,000 years, is

yet another tragedy.

A further addition to the tragedies is the fact that the Mahatma quitted within a year of the British quitting for which event he had waited

so long.

Mahatma Gandhi served his country and the world with unabated ardour and devotion in spite of illness and advancing years and at last paid the supreme penalty in what is surely one of the greatest tragedies of history. Perhaps it is a fitting conclusion to his unique record. Perhaps only thus could his message be stamped on men's minds with indelible effect as it were by fire '.-F-M Smuts (Reuter, Sunday Statesman, 11th July, 1948, Calcutta late city edition, p. 9, col. 3).

The tragedy of tragedies is the fact that we have lost our Bapu. The world had been enveloped in gloom and human hearts have been filled with ache. The gloom will clear in time. The ache will remain. A previous ache, 1,915 years old, still persists, and is at once an agony,

a treasure and a salvation.

Medical News

MAHATMA GANDHI

AT a meeting held on 2nd February, 1948, at the School of Tropical Medicine, Calcutta, attended by the entire staff. patients and the public, the following

resolution was unanimously carried:—
'That the news of the sudden death of Mahatma Gandhi, one of the greatest men of all ages, the apostle of truth and non-violence, who was the pride and glory not only of India but of the world, was indeed too stunning for words. We express their inexpressible

sorrow at the event.

That we all attending this meeting pledge ourselves with heart and soul to follow the tenets and teachings of the Mahatma towards making the world better, brighter and happier, by banishing hatred and strife through the path of non-violence and by abolishing distinction between caste and creed, race and nationality, rich and poor.

We pray that in this hour of trial in India's destiny

the Mahatma's eternal spirit may guide us to enable

us to attain his cherished goal.

That we at this meeting pledge our loyal and unstinted support to Pandit Nehru, Sardar Patel, Dr. Rajendra Prasad, Dr. B. C. Roy and other leaders, the disciples of the Mahatma, who have been left behind to carry out his cherished aims.

It is resolved that a copy of this resolution be sent to the Hon'ble Premier, West Bengal, for intimating to the Government of India and the bereaved members

of the Mahatma's family.'

At a prayer meeting of the staff and students of the Grant Medical College, Bombay, in memory of the late Mahatma Gandhi, held on 31st January, 1948, the students recited his favourite hymns and prayers and were addressed by the Principal. The latter in a brief speech impressed on the students that though Mahatma Gandhi had passed away, his spirit was immortal and it was the duty of every Indian to cherish that spirit in his heart and in every daily action try to follow the gospel of truth, love, service to our fellowmen, and non-violence.

At a meeting of the General Body of the Grant Medical College Students held on 12th February, 1948, the question of raising a suitable memorial to Mahatma Gandhi was considered. A scheme was drawn up briefly -

on the following lines:-

(A) Education throughout school and, if possible, at the Grant Medical College of one or more deserving children, as far as possible from the Harijan community of the Inferior Establishment of this institution; It was pointed out by the Principal that such

a living memorial to the Harijan uplift work of late Mahatma Gandhi would be the most fitting

tribute we could pay to his immortal spirit. Starting of literacy classes amongst the Inferior Establishment of this institution by studentvolunteers;

Starting of classes for the study of the National language.

It was felt by one and all that instead of a memorial in stone or marble, it was more befitting that each one of us should contribute to the above constructive programme which was so dear to the late Mahatma.

Communications were also received from (1) the Inspector-General of Civil Hospitals, U.P., (2) the Director, Central Research Institute, Kasauli, (3) the Principal, Carmichael Medical College, Callery Principal, Carmichael Medical College, Calcutta, (4) the Principal, Lady Hardinge Medical College, Delhi, and (5) the Superintendent, Calcutta Medical School and Hospital.

SIR BERNARD SPILSBURY, M.B., F.R.C.P. (Abstracted from the B.M.J., 27th December, 1947, p. 1059; 3rd January, 1948, p. 29)

SIR BURNARD SPILSBURY, whose sudden and tragic death took place in his laboratory at University College, London, on 17th December, was one of the most distinguished figures in forensic medicine. Sir Bernard was inevitably accorded in the public mind Bernard was inevitably associated in the public mind with the unravelling of sensational crimes, and the high-lights were always upon him when he appeared, as he frequently did in the course of 25 years, in the

witness box in trials in which the crime had been of an unusual character. But among those best qualified to judge he had a greater reputation as an outstanding authority on the medical investigation of causes of death. His best work was seen on the one hand in the patient investigation of innumerable cases which

the patient investigation of innumerable cases which had no particular public interest, and on the other in the quieter paths of teaching, at which he excelled.

Bernard Henry Spilsbury, the son of a chemical manufacturer, was born in 1877. He was educated at Manchester Grammar School, and went on to Magdalea College, Oxford, taking his B.A. in 1899 and proceeding to St. Mary's Hospital, London, where he qualified in 1905. At St. Mary's he came under the tutelage of the late Sir Almroth Wright, principal of the Institute of Pathology and Research, and his early work was in late Sir Almroth Wright, principal of the Institute of Pathology and Research, and his early work was in the bacteriological field. His first paper, contributed to the Transactions of the Clinical Society in the year of his qualification, was on pneumonia caused by B. typhosus in the course of enteric fever. Presently B. typhosus in the course of enteric fever. Presently he became pathologist, lecturer in pathology, and curator of the museum at St. Marv's. His bent towards morbid anatomy was due to the influence of three brilliant men attached to St. Mary's at that time, namely, A. J. Pepper, the Home Office pathologist; A. P. Luff, scientific analyst to the Home Office from 1892 to 1908, who had become widely known in criminal investigation; and William Willcox, who had lately taken up the appointment as lecturer on chemical pathology and lecturer on forensic medicine at St. Mary's which he was to hold for thirty years

at St. Mary's which he was to hold for thirty years.
With these three men Spilsbury was associated in his first famous case—the case of 'Dr.' Crippen, who was convicted in 1900 of wife-murder. As a result of the patient investigation of human remains found in the cellar of a house in Camdan Town a fraction of a Town cellar of a house in Camden Town, a fraction of a grain of hyoscine hydrobromide was isolated from portions of the viscera of the victim five months after the murder. In that same year, 1910, Spilsbury succeeded Pepper as pathologist to the Home Office, and so began his connection with many celebrated trials which confinued until he retired from active work of this kind, retaining the title of honorary pathologist to the Home Office in 1934. He was knighted in 1923.

Office in 1934. He was knighted in 1923.
Spilsbury had exactly the qualities needed for such a position. He was patient in his investigations, bringing to them a disciplined mind, a critical and unprejudiced consideration, and the utmost care in arriving at his conclusions. His note-taking was voluminous; he was documented even on the most minor points, and the case-books filled with his neat writing must be a unique record in the history of crime. If his methods of investigation were beyond reproach, the presentation of his facts was equally admirable. Once, in an address to the West London Medical Society, he described the perfect medical witness, and warned doctors who had to go into the witness box against prolixity, indistinctness, the use of largon or superlatives, exaggeration, bias, and loss of temper. None could accuse him of any of these faults. He was a witness after the judge's heart, giving his evidence in clear-cut fashion, never declamatory or violent in assertion, but always sure of his case and speaking with unmistakable authority. His evidence was always directed not to the securing of a conviction but to the assertainment of the truth and to the factors. was always directed not to the securing of a conviction but to the ascertainment of the truth and to the fulfilment of justice, and whenever anything was to be said in favour of an accused person, one could be quite sure that Spilsbury would say it.

He was lecturer in morbid anatomy at St. Bartholomew's, and in forensic medicine and toxicology at the London School of Medicine for Women; he was examiner in forensic medicine at different times to six examiner in forensic medicine at different times to six English universities, and in pathology to the University of London. In 1913, he contributed a paper to the International Congress of Medicine on the pathological aspects of deaths under anæsthetics. During the first world war, like his colleague, Sir William Willcox, he made a special study of toxic jaundice, especially in munition workers, and presented the results to the Royal Society of Medicine. In 1924 he was Lettsonian leaturen Society of Medicine. In 1924, he was Lett-omian lecturer

to the Medical Society of London, taking as his theme wounds and other injuries. In 1932, he was vice-president of the Section of Forensic Medicine at the Centenary Meeting of the British Medical Association, and contributed to a discussion on the pathologist in coroner's courts, urging that the proper person to maker a medico-legal examination of a dead body was an experienced pathologist who could also carry out any laboratory investigations that might be necessary. For many years he was secretary to the Medico-Legal Society, and contributed numerous papers to its proceedings, notably one on the medical investigation of crimes of violence. In 1933, he was president of that Society; his address from the chair was on certain forms of death, particularly in relation to criminal abortion. Beyond the papers which he contributed to the various societies he wrote very little, though it is understood that he had for some years been engaged in the preparation of a standard work on medical jurisprudence. His system of complete record-taking and careful indexing should make it possible for some other hand to complete the work. He became M.R.C.P. in 1924 and F.R.C.P. in 1931.

Spilsbury had peculiar opportunities of studying the many years he was secretary to the Medico-Legal

Spilsbury had peculiar opportunities of studying the psychology of murderers, in particular the way in which they bore their burden of scorecy. He once gave it as his view that the murderer was impelled to make some oblique reference, if not a complete confession, to his act before his apprehension. The murderer, he said, turned the crime over and over in his mind until he arrived at some self-justification and wittingly or unwittingly gave voice to it. He had also noted the desire of many nurderers for publicity. One of his desire of many murderers for publicity. One of his first cases was that of the notorious murderer seddon, and Spilsbury told how he had watched Seddon move eagerly to the police-court window where the press

photographer could take his portrait.

In appearance Sir Bernard Spilsbury was the very opposite of what might be expected in a man whose pre-occupation was with the macabre. His jovial, freshcoloured face, his invariably correct attire, and little touches, such as the flower in his button-hole, gave him the look of contented prosperity. His love for flowers and music-he was frequently seen at concerts if Beethoven or Mozart was on the programme—was well known. But in recent years he had had more than one illness, and those in close touch with him in the pharmacological department of University College, Gower Street, where he continued to work, and work hard, noticed how much he had aged. Tragedy had overtaken him in the death of two of his sons, one of them had a product the sons of the sons o them, Alan, closely associated with his father's work, them, Alan, closely associated with his lather's work, and the other, Peter Bernard, who was on the threshold of his medical career when he was killed in the destruction of a part of St. Thomas's Hospital during an air attack on London in 1940.

Perhaps one of the most important results of his property and the countries of his countries and the countries of his countries and the countries of his influence.

work—one which cannot be overstressed—is his influence upon coroners. When Spilsbury commenced to work for them, they employed but few trained pathologists and the work was not of a very high order. Nowadays, thanks to him. coroners have realized the importance of the applement of the involvement of the applement of the property of importance of the employment of trained pathologists.

FREE MEDICAL SERVICE FOR ALL How BRITAIN'S NATIONAL HEALTH SCHEME WILL WORK By JOHN RIGG

(Reprinted from a Release No. F.560 issued by the British Information Services, New Delhi)

Every family in Britain is now being supplied an official leaflet explaining how they will be able to make use of the new health service which starts in July. Altogether some 13,000,000 copies of the leaflet will be distributed.

The National Health Scheme offers a wide range of services on a larger scale than has ever before been attempted. Every man, woman and child in Britain will be able to make use of medical, dental and nursing facilities free of charge and without insurance qualifications. The National Health Service is not a charity. Everybody bears the cost of the service mainly as

taxpayers.

The public will be entitled to receive advice and treatment from the family doctor of their own choice. All consultations between doctor and patient will remain personal and confidential as at present. Most families will choose to retain the services of their present doctor. Anybody who wishes to change doctors and anybody who is not already on a doctor's list is asked to make a choice now in order that the scheme can start efficiently and smoothly.

SPECIAL SERVICES

Besides private treatment, everybody will be entitled to the medical and health services offered by general or special hospitals. Included in these amenities are maternity care, sanatorium treatment, care of mental health and all kinds of surgical operations. Hospital charges will cease on 5th July, but accommodation permitting patients will be able to pay for greater

Medicines and drugs prescribed by doctors will be obtainable free of charge from all dispensing chemists taking part in the scheme. In the same way, all the necessary appliances will be available without charge to

the patient.

At present there are too few dentists to make the full service available straightway, but after 5th July a special priority service for expectant and nursing mothers and young children is being organized by the local authorities. This is in addition to the free dental service at the disposal of all school-children. Partial dental service, which will come into operation in July, offers free treatment to the general public on the same lines as that provided by the medical service.

HEARING AID

Special eye treatment will be undertaken by specialists at hospitals and clinics as part of the free hospital service. Several different types of spectacles will be provided without charge.

Free distribution of a new hearing aid invented by a special committee of the Medical Research Council will be made shortly to all deaf patients while specialist ear clinics will be established as resources allow.

As soon as possible it is hoped to organize local Home Health Services throughout the country. Under the direction of local authorities this additional service will provide for advice and care for expectant mothers and children under five, home nursing, vaccination and immunization services and the appointment of health visitors to deal with problems of illness in the home.

A total of £150,000,000 (Rs. 199.65 crores) has been set aside to cover the costs of the new health services during the first nine months from the inauguration

date in July.

BRITAIN'S NEW SOCIAL SECURITY SERVICES

Every child or citizen of Britain, whatever the circumstances of his or her birth, shall be assured freedom from insecurity, anxiety and want, and equal opportunities in regard to health, education and employment.

This series of three articles by eminent authorities on social questions gives a comprehensive picture of the enlightened social measures (shortly to be put into operation) for which the State has assumed increased

responsibility.

No. 1-Freedom From Want By G. GRAFTON GREEN

(Reprinted from F.708. Issued by the British Information Services, New Delhi)

After 5th July, no man, woman or child in Britain need ever again be in real want. No family in the

land need fear that an unexpected illness with heavy doctor's bills will wreck the economy of the home. No sick person need worry that lack of means will prevent

sick person need worry that lack of means will prevent him getting the best specialist advice and treatment. For, on 5th July, Britain's new social security system, the most comprehensive devised by any country in the world, comes into full operation. A dream, talked about in one of the darkest years of the war when Britain was fighting for her existence, will come true.

It was in June 1941 while the war's greatest victories

It was in June 1941, while the war's greatest victories were still to be won, that the first step was taken by the Coalition Government of Right and Left to survey the country's social services with the object of bringing them into line with modern ideas of social justice. Eighteen months later Sir William (now Lord) Beveridge presented his famous report outlining a plan for social security which went far beyond anything attempted before. In principle the greatest part of it was accepted by the Government, and experts set to work to draw up a detailed scheme

That scheme, published as a White Paper in the autumn of 1944, set the seal on more than 300 years' work in Britain to achieve complete social security.

It was a scheme which covered everybody, whether wage earners, salaried workers, captains of industry or owners of one-man businesses. It provided for a sys-tem of family allowances and higher rates of sickness and unemployment benefit. It called for a central fund to which all would contribute.

FAMILY ALLOWANCES

A few weeks later a Ministry of National Insurance was set up to take over responsibility for existing social insurance schemes and prepare to operate the new plan. In August 1946, the first family allowances were paid in Britain—5s. (Rs. 3 As. 5) a week for every child, except the first in a family.

Now the two other great Acts begin to operate, the National Insurance Act and the Industrial Injuries Act,

and with them a national health service.

In the last few weeks every home in Britain has received a pamphlet explaining how the new health service will work, and a 32-page guide to family insurance will follow. They tell the story of a co-operative system which covers every citizen, literally from the cradle to the grave.

Let us see how it will affect John Smith, a typical

citizen, who is married and has two children.

Mr. Smith and his family will continue to get advice and treatment from a family doctor of their own choosing. The difference is that after 5th July the doctor will not send in a bill. If Mrs. Smith wants a separate doctor she can have him. If any of the family need hospital treatment, surgical operations, medicines or drugs they will get them—without charge.

If they need dental treatment or new dentures, specialist eye treatment, spectacles or other appliances there will not the medicine or new dentures. they will get them without fee. Hospital charges will cease on 5th July, although if Mr. Smith wants to be in a private ward he can have this by paying for it.

MATERNITY GRANT

If Mrs. Smith has another baby she will have the if Mrs. Smith has another baby she will have the services of a doctor and midwife, as well as general care before and after birth. On the day the child is born she will get a maternity grant of £4 (Rs. 53). If she normally goes out to work she will also have a maternity allowance of 36s. (about Rs. 23 As. 14) a week for 13 weeks. If her work is solely in running the home she will get an allowance of 20s. (Rs. 13 As. 4) a week for four weeks instead. And, of course, she will get another 5s. a week family allowance for the new child, until it becomes the eldest in the family under school-leaving age.

under school-leaving age.
Let us assume that Mr. Smith comes into the first category of insured persons: those who work for an employer. (In the second category are people in business on their own account, and in the third what are called 'non-employed persons'.) If Mr. Smith is all he will get, in addition to free medical treatment, sickness benefit of 26s. (about Rs. 17 As. 4) for himself, 16s. (about Rs. 10 As. 10) for his wife, and 7s. 6d. (about Rs. 5) for the first child: the other children will continue to receive the 5s. a week family allowances. His benefit will continue as long as the illness lasts; and if necessary will be replaced by a retirement pension when pension age is reached.

If he is unemployed the benefit of 16s. a week will go on normally for 180 working days, but may be continued up to a year. Even that may be extended on the recommendation of a local tribunal, which will not

act on the basis of a means test.

INDUSTRIAL INJURY

If Mr. Smith is injured at work, or becomes a sufferer from an industrial disease, he will, while incapable of work, get 45s. (Rs. 29 As. 13) a week with 16s. for his wife and 7s. 6d. for the eldest child. After 26 weeks or when he returns to work disablement benefit may be paid with an additional allowance in certain cases, for example, if he is unemployable, or needs constant attendance. needs constant attendance.

When Mr. Smith reaches the age of 65, he gets a pension of 26s. a week provided he has then retired from regular employment, and his wife gets 16s. a week if she has reached 60 and is not working otherwise than in the home. If Mrs. Smith is not 60, Mr. Smith gets an extra 16s, in his own pension for her. If Mr. Smith goes on working he does not draw his pension at once but gets a higher rate of pension when he retires.

Mr. Smith's insurance, of course, provides for his wife and family in the event of his death. In that event, Mrs. Smith gets a widow's allowance of 36s, a event, Mrs. Smith gets a widow's allowance of 36s. a week for 13 weeks with an extra 7s. 6d. a week for her first child under school-leaving age. When the widow's allowance stops, there is a widowed mother's allowance of 33s. 6d. (about Rs. 22 As. 3) a week for herself and her child together, which continues so long as the child is under school-leaving age. If, when the widowed mother's allowance comes to an end, Mrs. Smith is over the age of 40 and has been married for Smith is over the age of 40 and has been married for 10 years, she gets a pension of 26s. a week for life. The scheme also provides for a grant of £20 (Rs. 265) towards funeral expenses.

OTHER PROVISIONS

These are no more than the main features of the social security scheme. They do not take account of provision made to meet all sorts of special cases, and to bridge the gap between the ending of one form of benefit and the start of another. For instance, if a child loses both its parents a weekly allowance will be paid to the guardian who takes the child into his family until the child reaches school-leaving age, which is now 15 years.

One of the greatest advances has been made by the new scheme for looking after people injured at work. It replaces the complex Workmen's Compensation Act which have often been the cause of bitterness and hardship by their accent on the business side of the

Employers and employees come in as equal partners under the Industrial Injuries Act, which covers all employed persons whatever their income, job, age or sex. Under the present law all non-manual workers earning more than £420 (about Rs. 5,590) a year are excluded.

Benefit will not be based on loss of earnings but will be a compensation for the injury suffered. And unlike workmen's compensation, it will not prevent a

man taking action in the courts for damages.

Another important point is that with a pension based on personal disablement, including disfigurement, a person may be able to earn as much or even more than he did before the accident, and still go on drawing his full pension.

FOOTING THE BILL

Who is to meet the bill, running into many millions of pounds a year, for these new and improved social

The answer is, Everybody in Britain. It is services?

not something for nothing.

Weekly contributions [4s. 11d. (about Rs. 3 As. 3) by an employee in the first category, and 4s. 2d. (about Rs. 2 As. 12) by his employer will be paid by almost everybody over school-leaving age and under pension age, except married women who do no work outside the home. They will be covered by their husband's contributions.

But all these contributions will not pay even half the total cost. The remainder—estimated at 54 per cent, rising to 64 per cent in 20 years' time-will come

out of taxation.

It is, therefore, a fully co-operative undertaking between the citizen and the State, in which the citizen obtains security without the sacrifice of individual liberty.

Its success depends in the last resort on the efforts of the people themselves, because it rests on the con-

or one people themselves, because it rests on the continuance of a high and stable level of employment.

'Freedom from want', said Sir William Beveridge, cannot be forced on a democracy or given to a democracy. It must be won by them. Winning it needs courage and faith, and a sense of national unity'.

No. 2-The Advantages of Social Insurance By SIR RONALD DAVISON

Britain claims to have been a pioneer in social betterment, and during the last 40 years, United Kingdom governments of all political parties have enacted a steady stream of social legislation to better the lot of the ordinary citizen and achieve some measure of social

Now, after World War II, another forward move is in progress. The first step was the payment of family allowances. Since August 1946, the State has paid to the mother of a family the sum of 5s. (Rs. 3 As. 5) a week for each one of her children under 16, except only the first born. At the other end of family life, the rate of old age pensions was in 1946 more than double for retired people. But this later reform was really only an advance instalment of the Government's new scheme of all-in national insurance, a major undertaking which will begin on 5th July.

When it is in operation it will assuredly be the most complete and ambitious scheme of compulsory contri-butory social insurance yet attempted in any country. butory social insurance yet attempted in any country. It will affect the whole population of 46,000,000 and will provide cash benefits during sickness, unemployment, old age, widowhood, and other contingencies. It will include a funeral grant. Married women, particularly during maternity, are to be well looked after. Those who normally work, even though they pay no contributions themselves, will receive a maternity allowance of 36s. (about Rs. 23 As. 14) for 13 weeks, and other women an attendance allowance of 20s. and other women an attendance allowance of 20s. (Rs. 13 As. 4) for four weeks. All will receive a maternity grant of £4 (Rs. 53) for each child.

FLAT RATE

The normal benefits and pensions are fixed on a flat rate of 26s. (about Rs. 17 As. 4) a week for a man or woman, with 16s. (about Rs. 10 As. 10) allowance for an adult dependent and 7s. 6d. (about Rs. 5) for the first child. That adds up to 49s. 6d. (about Rs. 33 As. 8) a week for a man, wife and first child, together with the ordinary family allowances of 5s. (Rs. 3 As. 5) a week for children who come later. All this is going to be costly, and the insured person's weekly contributions will not be small. They will in fact be 9s. 1d. (about Rs. 6) for a man—of which 4s. 8d. (just above Rs. 3) is paid by the man himself—or nearly double the weekly premiums now paid by employed contributors and their employers to

paid by employed contributors and their employers to the two lesser and more modest social insurance schemes for health and unemployment which have been working in Britain since 1912.

But in addition to the contributions of the insured and their employers there will also be a considerable

State subsidy to the new insurances. This will add considerably to the financial attractiveness of the scheme to the average citizen in Britain.

It may be objected that the subsidy will be paid by the taxpayers, who are the same as the persons insured under this national insurance for all citizens. That, of course, is true enough, but the State collects income taxes according to individual capacity to pay, and not at a flat rate like the weekly insurance premiums. This means that bigger incomes bear more of the subsidy than lower incomes; to that extent, and in other ways, the new social security plan will have in other ways, the new social security plan will have an equalitarian effect in Britain.

ALL TO SHARD

All classes are to share in the scheme, not only those employed for wages and salaries. It will be the guarantee of pensions for the old and for widows, pensions that will make weekly contributions particularly worth while for those who are self-employed, and also for the small number of non-earners. The columbor-contributors subject to minor exceptions only non-contributors, subject to minor exceptions, will be most married women and all children under 16 years. That leaves 26,000,000 persons between the ages of 16 and 65 to pay weekly contributions.

ages of 16 and 65 to pay weekly contributions.

The balance in favour of the average contributor to this scheme will, in fact, be quite remarkable. For it is estimated that, in future, the married man who draws his retirement pension of 42s. (Rs. 27 As. 13) a week for himself and his wife for as much as 10 years (say from 65 to 75) will receive eight times what he paid. That does not include any benefits, such as sick benefits which he may draw during his working life. benefits, which he may draw during his working life. No commercial insurance company in the world could offer such terms.

· Behind the Insurance Act stands the new scheme of national assistance under which any person aged 16 or over living in Britain (whether or not of British nationality) who is without sufficient means of support can apply to the National Assistance Board.

UNIFORM STANDARD

This scheme is the final stage of transferring from the local authorities to the Government the responsibility for paying cash according to their needs to persons not entitled to national insurance benefits or whose needs are not fully met by those benefits. One of the advantages of this centralization is that the standard on which assistance is based is a uniform one instead of varying according to where the person comes

But perhaps the greatest of all Britain's new ventures in the social field is the setting up of a 'Free-for-all' national health service. A complete medical service, including general practitioner and hospital treatment, is to be open for all citizens without charge from 5th July.

This will have nothing to do with insurance or the payment of a specified number of contributions, though in fact the new national insurance fund will hand over to the Treasury a sum of £32,000,000 (Rs. 42,59 crores) a year to help pay the health service bill of about £240,000,000 (Rs. 319.45 crores) a year. The average doctor in general practice may have a maximum of 4,000 persons on his list and will be paid his capitation fees accordingly. The close personal relationship between the family doctor and his patients will, it is hoped, be fully preserved.

The general economic and social policy of Britain to-day has a three-fold aim—greater productivity, stability and social equity, three closely inter-related conditions. Towards these aims Britain already has a state of full employment at good wages, which seems likely to be maintained, and now a linked system of payment of a specified number of contributions, though

likely to be maintained, and now a linked system of social security covering all citizens will come into being on 5th July.

1325 - No. 3-Free Medical Care for All By DAVID A. LE VAY, M.S., F.R.CS.

Britain's new national health service, which comes into operation on 5th July, includes many innovations

and one change which is likely to be far-reaching, but it is essentially an extension of the principles laid down in 1911 in the first National Health Insurance Act. But its range will be universal-every man, woman and child, irrespective of whether or not they are paying insurance contributions, will be entitled to use all or any part of the services to be provided.

These include not only those of the family doctor but all forms of hospital and clinic treatment and after-care. And they are available without charge to all, and without inquiry as to insurance status at the time of treatment. Where the patient is insured only a small part of the weekly contribution goes towards the cost of the health service—8½d. (As. 7 Pies 6) for a man, 6½d. (As. 5 Pies 9) for a woman, with ½d. (Pies 5) from the employer in each case. Such payment will provide a total of some £32,000,000 (Rs. 42.59 crores) a year towards the cost to the Exchequer of the new health services of about £180,000,000 (Rs. 239.58 crores) a year.

The U.K. Government has discarded the idea of a closed medical corporation in favour of a highly decentralized pattern of heards and committees with

decentralized pattern of boards and committees, with considerable local autonomy and with wide representation of doctors, dentists, chemists, local authorities and the public at all levels. But all bodies are directly accountable to the Minister of Health by virtue of his responsibility to Parliament, so that dispute and criticism can reach the House of Commons at once.

ADMINISTRATIVE STRUCTURE

At the apex of the administrative pyramid is the Minister, aided by a Central Health Services Council of professional advisers. It is a three-sided pyramid formed by the hospitals with their specialist services, the family doctor service provided by the general practitioner, and the municipal clinic services of the local authorities.

Hospitals, whether voluntary or municipal, with their liabilities, assets and endowments, are taken over by the State except in a few special cases when this is thought to be unnecessary for the needs of the service. Private nursing homes are unaffected. The organization of the hospitals, now a national responsibility, is on a regional basis, the country being divided into 14 hospital areas, each covering several counties and based on a university with a medical school.

All the hospitals (perhaps some 200 to 300 in each area) come under a regional hospital board consisting of persons chosen after consultation with doctors, local authorities and other interested bodies. The board receives an over-all grant from the Exchequer annually and disburses this as it thinks fit to the hospital management committees of its area. These are also new bodies, set up not so much to manage individual hospitals, but to co-ordinate the work of groups of hospitals which together have a capacity of 800 to 1,000 beds or more.

Though the boards appoint the senior specialists thus making their services more widely available, and though the contracts of every grade of hospital worker lie with the boards, day-to-day management and expenditure and the engagement of other than senior staff are left wholly to the individual management committees. For the patient, hospital facilities are immensely improved, for they are quite free and include board, specialist attention and all treatment. As a result the almoner is set free for her proper work of dealing with social conditions.

PRIVATE FACILITIES

Nevertheless, private facilities will continue to be provided in some hospitals. Any patient, for example, who wishes, may pay for privacy if a room is available and is not needed on medical grounds for public patients. There will also be a number of fee-paying beds. Patients using these will pay the specialist attending them either fees according to a prescribed scale, or, in other cases, such fees as the specialist himself fives himself fixes.

In every branch of the service, however, there will be the right to use free facilities wholly or in part. Though the great teaching hospitals are also nominally taken over by the State, and their expenditure met, they are excluded from the domain of the regional boards, retaining their own boards of governors though these now include some public representatives. The medical schools and medical education are left entirely alone.

In general practice the unit of organization is roughly that of the county or large city, and the administrative body is the local executive council, half of whose members are professional men, such as doctors, dentists, or pharmacists, and the remainder local authority and public nominees. These councils will in the future elect their own chairmen and have decisive control over family medicine and dentistry in their district under the new service, their work developing naturally from the old panel arrangements.

CHOICE OF DOCTOR

Every doctor may enter the public service wholly or in part, retaining his former list of insured workers, though these, like all the newcomers, have a free choice of doctor if they wish. Facilities include general care by the family doctor, dental treatment (though this is guaranteed only for mothers and children because of the shortage of dentists), supply of all necessary drugs, instruments and appliances and hearing-aids, sight-testing and the provision of spectacles. Charges can only be made for extra-special demands like gold teeth or contact lenses, or for replacing breakages due to negligence.

A far-reaching feature in general practice is the introduction of the health centre as the unit of family medicine. The centres will be buildings established by the local authorities in every district, where doctors will see their patients in individual private consulting rooms. Municipal clinics will often be housed in the same centre which will then serve as the natural local focus of all health education.

Since health centres are likely to be a key feature of the service, by which its success will be judged, it is a pity that building shortages are likely to prevent the establishment of more than a few experimental ones during the next few years. Meanwhile, general practice continues in the doctors' own surgeries. In

any case, home visiting will be unaffected.

BASIC SALARY

Apart from any who elect to remain in private practice outside the scheme, doctors entering the public service lose the right to buy and sell their practices, receiving compensation for this loss of goodwill from a national fund of £66,000,000 (Rs. 87.85 crores). This a national lund of £66,000,000 (Rs. 87.85 crores). This compensation, with interest, will usually be paid at death or retirement. Pensions are also paid on retirement, or to the doctor's widow. Newly-qualified practitioners will be paid by a basic salary of £300 (Rs. 3,993 As. 9 Pies 9) a year with an additional capitation fee for each patient, and after three years may choose to give up the basic salary for a slightly higher capitation rate. Doctors already established in practice can choose either system of payment or change practice can choose either system of payment, or change from one to the other.

There is to be legislation to implement a promise that it will not be possible to bring in a full-time service by regulation. Such a step would require a fresh Act of Parliament. A single National Medical Practices Committee of Doctors will have the distribution of doctors under continuous survey, and newly-qualified entrants to the service after 5th July will not be allowed to settle in the public service in those few areas considered to be already over-doctored. Other-

wise there is no direction.

Complaints of a doctor's negligence or inefficiency can be made to the local executive council or to a national tribunal, which may decide in his favour, penalize him, or disqualify him from public practice in the area. Appeal lies to the Minister, who can

reverse a disqualification but cannot upset a favourable finding. The local authority health services are marked by a concentration of health powers with the larger units of local government, the county councils and county boroughs, which have in their turn, lost their municipal hospitals to the regional boards.

MUNICIPAL SERVICES

The municipal services include building and running the health centres, provision of maternity and child welfare clinics, and arrangements for ambulance services, vaccination and immunization. All these are free, as are after-care and health visitor facilities, though cortain outre provisions such as home health. though certain extra provisions such as home helps or special foods in case of need may carry a small charge

when circumstances justify it.
The care of venereal disease and tuberculosis, and the in-patient treatment of mental disease are handed over to the regional board, so that these services can be widely planned. In particular, more provision for out-patient clinics for mental disorders will result. Local health authorities will receive a grant-in-aid from the Exchequer varying from three-quarters to threeeighths of their expenditure according to the prosperity of the district.

Some general features of the new service include continuation into peace of the national blood transfusion service of the war years, and the establishment of a national public health laboratory service. The arrangements for Scotland and Northern Ireland, differing only in organizational details, are covered by separate Acts of Parliament.

To sum up, the new service, though providing no immediate utopia, will be available to everyone who wishes to use it, or any part of it. Its benefits will not be confined to the millions who will be paying national insurance. With the National Insurance Act and the Family Allowances Act, the Health Service Act completes a triad of social measures which give a striking example of national planning for security to the post-war world.

The co-operation of the medical profession, marked though it has been for the lieuter poression, market though it has been for the last few months by doubts and hesitations can, in view of recent concessions by the Ministry of Health, be regarded as largely assured by the time the scheme comes into operation.

BOMBAY MEDICAL COUNCIL

(From a Communication by the Registrar, B.M.C., dated 23rd June, 1948)

CODE OF MEDICAL ETHICS

(In force from 1st July, 1948)

In taking up the medical profession you have selected as one which is universally considered as the noblest, as its primary object is the alleviation of human suffering irrespective of gain.

It is your duty to do the best for your patients. You are not bound to treat each and every one who seeks your help, except in emergencies. You have the right to choose the patient and to lay down the limits of your service. But once you accept the charge it is your responsibility to exercise due care and diligence in the diagnosis and treatment, using the best means and opinions available to you. You cannot leave the patient without his consent except for very valid reasons. The discovery that the malady is incurable is not an excuse. Undertaking the care of a patient does not imply that you shall be blamed for not curing him. No blame will be attached if you have employed that skill and professional knowledge which your other college with the constitution of colleagues with a like qualification do in the community, Naturally more is expected of one who claims to be a specialist.

Your demeanour towards the patient should be courteous, sympathetic friendly and helpful.

While keeping the interest of your patients uppermost, you are not permitted to perform illegal operation or execute an illegal document or issue a false certificate.

Knowledge of a patient gained in the course of examination and treatment is privileged and should not be disclosed without the consent of the patient or an

order from a presiding judge in a Court of Law.

To other members of the profession you owe a duty as a colleague. You should never do anything which you would not like them to do to you. Do not undertake to treat a patient who, you know, is being treated by another physician nor do or say anything that may make the position of your colleague awkward that may make the position of your colleague awkward. Most of the suits for malpractice arise out of such remarks. Always respect opinions and differences of opinion.

In practising your profession use methods of fair competition. It is unethical to advertise yourself or solicit practice in any way.

WARNING NOTICE

The Bombay Medical Council desires to bring to the notice of medical practitioners whose names are entered in their Register that if after due enquiry the Council finds them guilty of the following and similar unethical practices they are liable to be warned or have their names erased from their Register. The Council is in no way precluded from considering and dealing with any form of unethical practice which may be brought before them although it may not appear to come within the scope of precise wording of any of the categories mentioned below :-

PART I

Note.—Any one found guilty of offences mentioned in this Part will be liable to have his name erased from the Register without any further warning.

1. Immorality involving abuse of professional relationship.

2. Conviction by a Court of Law for an offence

involving moral turpitude.

- 3. Issuing in connection with various Government and Municipal Acts, sick benefit, insurance and kindred societies, passports, matters relating to armed forces, attendance in Courts of Justice, in the public services, or in ordinary employment, a certificate, notification or report which is untrue, misleading or improper.

 4. Withholding from the health authorities information of the notifiable discusses.

- 5. Performing or enabling an unqualified person to perform an abortion or any illegal operation for which there is no medical, surgical or psychological indication.
- 6. Performing or enabling an unqualified person to attend, treat or perform operations on patients in respect of matters requiring professional discretion or skill or to issue certificates.

Contravening the provisions of the Drugs Act

and Regulations made under it.

8. Selling scheduled poisons to the public under cover of his own qualifications, except to his patients.

9. Disclosing the secrets of a patient that have been learnt in the exercise of his profession. Those may be disclosed only in a Court of Law under orders from the presiding Judge.

10. Soliciting private practice either by splitting fees or paying commissions to those who bring patients to him or by advertising by means of laudatory or other notices in the press, or, by placards or by handbills.

11. Receiving commissions from surgeons, consultants, or from anyone to whom patients are referred to, be it a medical practitioner, a manufacturer or of trader in drugs or appliances or a chemist or a dentist or an oculist.

12. Advertising himself directly or indirectly such as through price lists or publicity materials of manufacturers or traders with which he may be connected in any capacity though it will be permissible for him to publish his name in connection with the prospectus or directors' or technical experts' reports.

PART II

13. Associating in professional matters with persons who do not possess a qualification registrable in India or who possessing such a qualification have been struck off the respective Registers for unethical practices.

Writing prescriptions in a secret formula.

15. Keeping an open shop for the sale of medicines. 16. Publishing or sanctioning the publication in the lay press of reports of cases treated or operated on by him or of any certificates for drugs, foods, appliances, sanatoria used by him or of any laudatory statement about himself or his address and telephone number unless he has changed his office or has resumed practice after a long interval in which case the notice should not appear more than twice and in not more than two papers, or inserting his name in the telephone directory in a special place by paying special rates.

17. Contributing to the lay press interviews, letters regarding disease and treatment which have the purpose of advertising himself and soliciting practice. It shall be open for him to write to the lay press under his own name on matters of public health interest and general articles which will promote hygienic living or deliver public lectures with the same purpose. Till such time as local medical publications offered the such time as local medical publications offered the desired publicity it shall be open to medical associations, hospitals and other bodies to advertise the name of the lecturer and his subject in the non-medical press provided that such a notice has already been sent to the medical press for publication, where available.

18. Attending a patient who is under the care of

another practitioner.

19. Attending on his own a patient who has been seen by him before in the capacity of a consultant

during the same illness.
20. Removing the patient in the absence of the attending physician to a hospital or a nursing home or transferring him to the care of his assistants by a consulting practitioner.

21. Doing anything that means unfair competition. Talking disparagingly of his colleague who attended the case before him or attends with him at a

consultation.

23. Examining and reporting on employees at the instruction of the employer without previously intimating the regular medical attendant of the employee of his commission and giving him the option of being present.

24. Using an unusually large sign board and writing on it anything else other than his name, qualifications obtained from a university or a statutory body, titles conferred by Government and the name of a speciality he practises. The same should be the contents of his prescription paper, which may in addition contain address and telephone numbers. Appointments held now or before should not be mentioned either on the board or prescription paper.
25. Refusing to attend on a patient who has been

under his care unless :-

(1) He finds that the patient and his relatives are non-co-operative, or (2) his fees are not paid, or (3) another practitioner is consulted without his knowledge.

Note.—The foregoing do not apply so as to restrict the proper training and instructions of bona fide students or the legitimate employment of dressers, midwives, dispensers, surgery attendants and skilled mechanics under the immediate personal supervision of a registered medical practitioner.

SUGGESTIONS

The following suggestions may be useful in medical

practice:—
1. You should strive to maintain your medical knowledge at a high level by regular reading, by attending refresher courses whenever available, and by attending refresher courses whenever in the meetings attending and taking an active interest in the meetings of your local medical society and conferences. Add your knowledge and experience to the common pool and thus contribute to the advancement of medicine.

2. Never forget that the doctor by virtue of his profession is given a high place in society. Study and assist in solving the civic and political problems of your society but not by neglecting your patients and profession. Do nothing to forfeit the esteem and the confidence of your fellowmen. In thought, word and

deed be a gentleman.

3. Every practitioner may charge a fee at each examination of patient and he should encourage the latter to get the medicine from a qualified pharmacist, as the small profit accruing from dispensing medicines to his patients is not adequate remuneration for his

professional services.

4. In serious illness, in doubtful conditions, in operations of a mutilating or destructive nature upon an unborn child, in operations which may vitally affect the intellectual or generative functions of the patient,

always ask for a consultation.

5. At the consultation there should be a free exchange of opinion. These discussions should be held without the presence of the patient or his relative. An agreed statement or otherwise should be communi-

cated to them by the attending physician.

6. Before performing an operation, obtain in writing the consent from the husband or wife, parent or guardian or the patient himself as the case may be. In an operation which may result in sterility the consent of both husband and wife is needed.

7. Do not undertake more work than you can conveniently manage. If you are running a dispensary practice avoid over-crowding by not calling patients twice or every day, unless it is essential to do so. To many medicines may be given for three days. Charge your fees every time you examine a patient. If you agree to attend a woman in her confinement you must

do so and the excuse that at the time you are engaged with another patient and could not leave is not valid.

8. Though your fees may vary according to the means of your patients, do not attend patients free of charge unless they are poor. There are hospitals for

9. If your patients need investigation and technical assistance which is beyond you and beyond the limits of the purse of patient, do not delay in referring him

to a public institution.

10. Do not claim to be a specialist unless you have put in a good few years of study and experience or have a special qualification in that branch. Once you say you are one, do not undertake work outside your

speciality even for your friends. Live and let live.
11. If you are running an institution for a particular purpose such as a mental home, a sanatorium, a house for cripples, blinds, etc., you may advertise it in the lay and medical press. The advertisement should not contain anything more than the following information :-

Name of the institution, the address and the approach, the types of patients admitted, facilities offered and the residential fees. The name of the Superintendent may appear in the medical press. It is not an advertisement to celebrate the annual function of your institution and invite your friends to it; such a function should not be reported in press.

12. While it is scientific to offer a good prognosis, if one's findings lead to it, it is unwise to guarantee

a cure.

13. Prescriptions, x-ray plates, investigation reports, are the property of the patient.

14. When issuing a medical certificate always enter the identification marks of the patient and keep a copy of the certificate.

15. Do not publish photographs or case reports of your patients in any medical or other journal in a manner by which their identity could be made out without their permission. Should the identity be not disclosed his consent is not needed.

16. If you are running a nursing home and if you employ assistants to help you, the ultimate respon-

sibility rests on you.

17. Do not accept appointments, whether honorary or salaried, in institutions where the practice is to 'split fees' for visits and injections between the practitioner and the institution.

BRITISH JOURNAL OF PLASTIC SURGERY (Published by E. and S. Livingstone Ltd., 16 and 17, Teviot Place, Edinburgh)

THE last war has left a legacy of deformities which has stimulated surgeons into developing plastic surgery as a special art. This new journal, of which the first number of the first volume has been published in April 1948, will fill a place which is very important and educative.

L. M. B.

NEW WONDER DRUG TO COMBAT PLAGUE: NUTRITION VALUE OF SOYA-BEAN

MEDICAL RESEARCH IN INDIA

(From a Release dated 15th July, 1948, issued by the Press Information Bureau, Government of India. New Delhi)

THE Annual Report of the Scientific Advisory Board for the year 1917, issued by the Governing Body of the Indian Research Fund Association, records another Indian Research Fund Association, records another than the Indian Research Published Property of the Indian Research Published Pub year of progress in medical research carried out in India. The bulk of the research work has been, as hitherto, in connection with those diseases, such as malaria, cholera, leprosy, malnutrition, plague, etc., which are responsible for high rates of mortality and sickness in India.

Malaria.—Trials to ascertain the comparative efficacy of various preparations of D.D.T. as indoor residual sprays against adult mosquitoes were carried out by the Malaria Institute of India, Delhi, in seven villages in the Delhi rural area.

This work had to be discontinued temporarily due to extensive flooding of the rural areas and on account of disturbances which took place in Delhi in 1947. The work is being continued.

Experience of work carried out by the Malaria Institute of India, Delhi, has shown that for indoor residual spraying, a stirrup pump fitted with a suitable nozzle is simpler and better than other types of spraying equipment.

Cholera.-Field trials in Bengal and Bihar to test the action of sulphaguanidine in the treatment of cholera were conducted under the distriction of the Director, School of Tropical The striking feature observed in the treatment of cholera with this drug was that in acts best during the early stages of the disease.

Therapeutic trials in the treatment of cholera with sulphaguanidine, sulphadiazine and phthalylsulpha-thiazole were also conducted in Calcutta under hospital conditions. The results indicate that of these three drugs, sulphaguanidine is the most effective.

Leprosy.-Three new drugs of the sulphone group, promin, diasone and sulphetrone, were tried out in the treatment of leprosy by the leprosy research workers at the School of Tropical Medicine, Calcutta, with very encouraging results. Although these drugs with very encouraging results. Although these drugs have certain limitations, they have proved particularly valuable in the treatment of those cases of leprosy which cannot tolerate injections of hydnocarpus oil.

Nutrition.—Research work on nutrition is being conducted under the auspices of the Indian Research Fund

Association in a number of centres all over India. The Nutrition Research Laboratories, Coonoor, have continued the work of previous years. Experiments to determine the comparative rate of growth of rats when fed on a diet containing ghee, purified groundnut oil and vanaspati respectively were started in 1947 and are being continued. Numerous requests for information and advice were received from Provincial Governments, the Central Government and private bodies and individuals all over India. The Nutrition Museum of the Laboratories continued to attract a large number of visitors.

Experiments to determine the nutritive value of soyabean milk and soya-bean curd have been conducted at the Indian Institute of Science, Bangalore. These, as now prepared, are both palatable and nutritious and the experimental feeding trials now under way in Bangalore indicate that soya-bean milk and its products can provide a cheap nutritious substitute for cow's

... Plague.-Field trials to determine the curative value of sulphadiazine and sulphamerazine in the treatment of bubonic plague were conducted under the direction of the Director, Haffkine Institute, Bombay, with good results. Sulphamerazine appears to be the drug of choice, as it gives the desired concentration in the blood with smaller doses administered at less frequent intervals.

The curative value of the new wonder drug streptomycin was tried out in experimental plague infection in animals. The results obtained were striking and the use of streptomycin is now being tried out in the treatment of bubonic plague in human cases, The

results reported are very encouraging.

Clinical research.—Experiments designed to produce lathyrism in laboratory animals have been carried out at the Nutrition Research Laboratories, Coonoor, with partial success. The real cause of this crippling disease which is associated with excessive consumption of khesari dal is not yet known.

Research on certain aspects of infantile hepatic cirrhosis has been conducted at the Indian Institute of Science, Bangalore, and the Sri Krishnarajendra Hospital, Mysore. The work done so far suggests that choline chloride supplemented with a pepsin proteo-lysed extract of the liver and spleen is effective in the treatment of the disease. Further clinical trials are in

Maternity and child welfare.—Based on the report of the enquiry on the bearing of premature and immature births on infant mortality in Bombay, a sub-committee has been appointed to draw up a memorandum on the conduct of enquiries into the important health problem of infant mortality.

NATIONAL HEALTH SERVICE BENEFITS FOR VISITORS TO BRITAIN

FREE MEDICAL ATTENDANCE DURING STAY (From a Release No. F.900 issued by the British Information Services, New Delhi)

ALL visitors to Britain, whether of British nationality or not, are entitled to use the National Health Service in exactly the same way as people living permanently in England, Wales and Scotland (Northern Ireland has its own Health Service). No contributions are payable.

People going to Britain with the idea of staying for more than three months will be handed, on landing, a leaflet setting out the main points of the Service and telling them that they may choose a doctor and get on to his National Health Service List. They will then receive a medical card. Lists of doctors, dentists and opticians taking part in the Service are available in Post Offices and Executive Council Offices.

MEDICINES WITHOUT CHARGE

People on shorter visits to Britain will also be reopie on shorter visits to Britain will also be entitled to all the amenities offered by the Service but will not need to choose a doctor. They will be treated in the same way as 'temporary residents' (i.e. people away from home or people who move from place to place). This means that if they are ill, all they need to do is to go to any doctor who has joined the scheme; he will then treat them free of charge, and any medicines which he prescribes will be supplied by the chemist without charge. They will be asked to fill in a simple form when they go to the doctor,

stating that it is not their intention to stay for longer than three months and giving their home address.

Apart from the right to the services of a doctor free of charge, any visitor to Britain in the event of serious illness is entitled to hospital and specialist treatment.

25TH ALL-INDIA MEDICAL CONFERENCE, 1948 SILVER JUBILEE SESSION—CALCUTTA

The Calcutta Branch of the Indian Medical Association has invited the 25th (Silver Jubilee) Session of the All-India Medical Conference to be held during the Christmas week this year in Calcutta.

Members of the profession who desire to read papers in the scientific session of the Conference, are requested to send a synopsis of the paper to the undersigned by the 15th October, 1948. Original copies of all papers must reach the office by the first week of December. The synopsis must not exceed 500 words and need not contain any graph, charts or formula. Contributions shall not contain more than 3,000 words of reading matter for the Conference.

It is hoped that the profession will co-operate with the Sub-Committee in making the Scientific Session a success.

B. P. NEOGY, ·

Secretary, Scientific Sub-Committee.

BRITISH RED CROSS PLANS 30-YEAR **PROGRAMME**

OVER RS. 16 CRORES EARMARKED FOR RELIEF WORK (From a Release No. F.927 issued by the British Information Services, New Delhi)

Plans for spending £12,500,000 (Rs. 16.64 crores) over a period of 30 years have been disclosed in a report just published by the British Red Cross Society and the Order of St. John of Jerusalem.

During the war over £63,000,000 (Rs. 83.85 crores)

were received by the Red Cross and St. John Fund, and most of the money was spent on helping those for whom it was primarily intended—the sick and wounded soldier, sailor and airman, the prisoner-of-war, and the

somer, sanor and airman, the prisoner-oi-war, and the civilian suffering from enemy attack.

The actual expenditure on the Red Cross and St. John services of this kind during the seven years from September 1939 to September 1946, was over £50,000.000 (Rs. 66.55 crores). Whatever help the Red Cross could bring, whatever relief it could give in the days of the year was readily given and with open dark days of the war, was readily given, and with open hands.

Part of the money now available will be for the provision of welfare officers attached to Service hospitals. At the present time there are 86 welfare officers so employed in Germany, Austria, the Middle East

and Far East, as well as in Britain.

But there is much more that can be done with so large a sum as £12,500,000 (Rs. 16.64 crores). Careful and detailed plans have been made by the British Red Cross Society and the Order of St. John of Jerusalem for spending the money (which was given to be used and not to be hoarded) over a period of roughly 30 years 30 years.

WELFARE SERVICES

The Red Cross will continue to give financial assistance to disabled ex-Service men in convalescent and rest homes. Funds have also been allocated for the maintenance of a National Red Cross headquarters for Red Cross for the fulfilment. a Red Cross Training College and for the fulfilment of the important duties which devolve upon the

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National Red Cross Society, both within the British Commonwealth and in the international sphere.

In many countries the health and welfare services are

badly in need of supplementary help, which is the special duty of the Red Cross to provide. Trained Red Cross officers are being sent overseas both to help in the formation of new branches and to advise and assist the branches which have already been established. Finance is provided to enable both the new and the existing branches overseas to get their Red Cross work

Internationally, the Society remembers with gratitude the help which it received from its sister societies, and the help which it received from its sister societies, and in its turn plays its full part in supporting the League of Red Cross Societies in co-operating with the International Red Cross Committee in attending International Red Cross Conferences, and in helping, where it can, sister societies in need.

Among those who have been helped recently are the Red Cross Societies of India and Pakistan. The British Red Cross Society has authorized expenditure up to £125,000 (.16 crores) from its own resources, apart from what it may receive from public subscription, in helping to relieve the terrible plight of the refugees in both these Dominions.

POST-GRADUATE MEDICAL EDUCATION IN BRITAIN

OPPORTUNITIES FOR OVERSEAS STUDENTS By SIR FRANCIS FRASER

Director, British Post-Graduate Medical Federation (From a Release No. F.885 issued by the British Information Services, New Delhi)

Post-grapuate medical education in Britain may be regarded as belonging to one or other of two categories, according as it is intended for the training of specialists, or for refreshing the knowledge of general practitioners and bringing it up to date. It is only in the last ten years that there has been any national scheme for providing general practitioners with regular courses of post-graduate instruction, and nationally organized plans for the training of specialists have only recently been made.

been made.

That is not to say that these forms of post-graduate education did not previously exist. They did. But they depended till recently on individual endeavour, the enthusiasm of local professional groups, or the initiative of isolated medical schools. All the medical enterty in the country and the teaching haspitels conschools in the country, and the teaching hospitals connected with them, provided opportunities for training in the specialties; but there was no agreed programme, nor were there any arrangements for co-operation.

TRAINING SPECIALISTS

The traditional basis of all training in the clinical The traditional basis of all training in the clinical branches of medicine and surgery has been the holding of resident hospital appointments following graduation. These appointments lead to increasing responsibilities as experience is gained, and are under the supervision of specialists of proved skill and wisdom. It is essentially training by practice as a member of a team, a training by apprenticeship. Only the more promising graduates obtain the higher positions in the team and eventually become specialists, the others drop out after one or more years to become general practitioners. And it is usually five to eight years or more. following it is usually five to eight years or more, following graduation, before a specialist obtains a permanent

appointment on the staff of a hospital.

This system makes no provision for certain important aspects of post-graduate education, such as opportunities aspects of post-graduate education, such as opportunities for research, practical experience of laboratory methods of investigations, time for reading and discussion, and attendance at demonstrations and at lectures by eminent practitioners of the specialty. The graduates who obtain resident appointments in the teaching hospitals of undergraduate medical schools can usually

obtain opportunities of these kinds in general medicine and general surgery, but in the special branches of medicine and surgery they have been difficult to provide, and in hospitals away from the teaching centres such opportunities, for advanced education have been completely lacking.

SUPPLEMENTARY COURSES

In order to fill these gaps and to supplement the practical experience gained in resident appointments, the larger universities have arranged courses of instruction for post-graduates, with practical work in wards and out-patient departments in addition to lectures; demonstrations, group discussions and laboratory work, covering periods of from three to six months. The undergraduate medical schools must provide primarily for undergraduate education, and it has been realized for some years that post-graduate education, and especially the advanced education required for especially specialists, could, only be provided efficiently in institutions allotted for the purpose.

For this reason the Government established the

Post-Graduate Medical School in London in 1935, with Professors and University departments in general medicine, general surgery, obstetrics and pathology, in association with Hammersmith Hospital.

Here are provided not only the resident appointments that form the basis of specialist training, but also courses of instruction to supplement the practical experience of graduates who obtain their appointments elsewhere, and opportunities for laboratory work and for study in the museum and the library. This modest beginning demonstrated clearly the need for very-considerable expansion, but the war interrupted its further development.

POST-GRADUATE INSTITUTES

As soon as the war ended, the University of London As soon as the war ended, the University of London realized the pressing need for similar departments in the special branches of medicine and surgery. In London, with its large population and educational centres, there are numerous hospitals; and among them certain special hospitals that have for many years provided opportunities for practical training in their special subjects, and acquired a world-wide reputation. The University has now established Post-Graduate Institutes at a number of these, with laboratories and other accommodation for research and teaching, of University standard in the special branches; and others

other accommodation for research and teaching, of University standard, in the special branches; and others are being developed as rapidly as conditions permit.

Already Institutes of Child Health, Psychiatry; Neurology, Ophthalmology and Laryngology and Otology are in being and those in Diseases of the Chest, Cardiology, Dermatology, Orthopædies, Urology and Dental Surgery are in various stages of development. More opportunities are required in general medicine, general surgery and obstetrics than the Post-Graduate Medical School alone can provide, and further general hospitals and schools will be brought into the scheme as soon as possible.

as soon as possible.

The number of graduates from overseas following full-time programmes of study in the Post-Graduate Institutes in London on 31st October, 1947, was 366, of which 262 came from the British Commonwealth and Empire, and 104 from other countries in Europe. and Empire, and 104 from other countries in Europe, Asia and America. At the same time many overseas visitors were attending part-time courses of instruction, both in London and at other centres in Britain. To administer the scheme, and to effect co-operation among the various institutions providing post-graduate opportunities, the University has formed the British Post-Graduate Medical Federation, with a Central Office and Bureau of Information.

SUITABLE REVISION

In addition to the medical schools of the University, both undergraduate and post-graduate, the Royal Colleges of Physicians, of Surgeons and of Obstetricians and Gynecologists provide revision suitable for candidates for their special diplomas, in the form of series of lectures by experts from all over the country.

In these ways there has been started in London a scheme that will add very considerably to the restricted opportunities for post-graduates hitherto available in the undergraduate medical schools, but these will continue to be regarded as the most satisfactory for those fortunate enough to obtain them. They are available not only at the 12 undergraduate medical schools in London, but also at each of the other 12 universities with medical schools in Great Britain. These, too, have plans for post-graduate institutes in special subjects, and many of them, especially Edinburgh, provide valuable courses of instruction to supplement the practical experience obtained by resident hospital appointments. Nearly all the Universities provide courses in Public Health, and there are Schools of Tropical Medicine in London and Liverpool.

This scheme for post-graduate education in the clinical specialties, based as it is on resident hospital appointments and requiring several years of study and practical experience, is designed primarily for graduates from the medical schools of Britain.

It would be difficult for visitors from other countries to follow the whole of the programme; nor is this necessary. They will usually obtain their practical experience in their own countries and come to Britain when they have already spent several years in hospital work, returning to their own countries to continue in more responsible appointments. For these the courses of instruction, with practical work in wards and outpatient departments, are eminently suitable. Some obtain posts as clinical assistants; some may obtain resident hospital appointments if they are able to remain in Britain for a year or more. Colleagues on the teaching staffs of universities in other countries are especially welcome, and arrangements are made for them to visit the medical schools and hospitals and see the work of British specialists.

BASIC SCIENCES

Advanced education in the laboratory sciences on which the practice of medicine depends, such as anatomy, physiology, biochemistry, pharmacology and pathology, requires practical work in the laboratories of the universities over a period of two or more years, and cannot be effected by courses of instruction. To be admitted to these departments and given opportunities for research, it is usually necessary for visitors to have had considerable experience of similar work in their own countries. Application must be made to the head of the department and supported by personal recommendations from those under whom the applicant has worked.

Such opportunities are available in all the universities and medical schools. Many British scientists and professors in these subjects have world-wide reputations for research, and have contributed notably to advances in medical science, and places in their laboratories are

much sought after.

In both the clinical branches and in the laboratory sciences, the strength and the reputation of British medicine depend on the essentially practical nature of post-graduate education. The graduate comes into close contact with the teachers, and acquires much by their example, and from observing them in the exercise of their profession. It is therefore necessary to limit the size of classes, and in the years immediately following the war there has been a greater demand from graduates from abroad than can be met.

It is important, therefore, that applications should

It is important, therefore, that applications should be made well in advance, be supported officially, and accompanied by full details of the candidate's previous experience and training.

GENERAL PRACTICE

In providing post-graduate education for general practitioners, the aim is to enable each to remain in contact throughout his career with the work of a hospital staffed by specialists. This is best done by

arranging for the practitioners to hold appointments as part-time clinical assistants in the various departments of their local hospital, and to help both in the wards and in the out-patient clinics, and also by arranging in these hospitals regular and frequent meetings, specially planned to help the general practitioner and to keep him in touch with progress in methods of investigation and treatment. In addition, special courses are given in teaching centres, either full-time—lasting one or two weeks—or on one day a week and spread over a number of weeks. The programme cover the whole field of general practice.

whole field of general practice.

None of these forms of post-graduate education is very suitable for visiting general practitioners, except the full-time intensive courses. Practitioners who come to Britain for a short time only attend one or more of such courses, and so obtain a broad view of practice. Special arrangements can always be made for small groups who wish to study some particular subject, or some special aspect of medical practice in Britain.

When the hospitals and medical schools are able to expand again as the country recovers fully from the effects of war, and now that the National Health Service is established, the opportunities for medical graduates from overseas to share in her post-graduate education—both general practitioners and those training to be specialists—will be much greater.

The Indian Medical Gazette Fifty Years Ago

LONDON LETTER

(From the Indian Medical Gazette, 33, July 1898, p. 267)

THE very important subject of 'The possibility of acclimatization of Europeans in tropical countries' formed the subject of an interesting discussion at a meeting of the Royal Geographical Society held on the 27th of April. The dis-cussion was opened by Dr. L. Sambon, on whose views, with regard to the microbic causation of the thermal form of sunstroke, I offered some remarks in a recent letter. Dr. Sambon contended that tropical deterioration was a phantom that was rapidly vanishing in the light of modern science; that tropical ill health was a consequence or sequel of tropical diseases due, most if not all of them, to microbes, and that if we could overcome or exclude these by hygienic improvements, there was no reason why the white man and his progeny should not thrive in the tropics, colonize, and work with impunity.

The indigenous inhabitants of tropical countries must, to a large extent at any rate, have been originally imported, and the question of acclimatization to tropical conditions had thus in the world's history, obtained a very large exemplification and proof. He states with perfect truth that hygiene had, as a matter of fact, done grand service in preserving the health of the European in the tropics, extending life and averting deaths. Why should this beneficient progress not be maintained and accelerated? He was followed by other speakers who, while inclining to support his contention, did

not take quite so sanguine a view of the situation. Some held that deterioration of the individual and of his offspring in the tropics was a lamentable and undeniable fact. Others demanded time (perhaps centuries or ages) for adaptation of a race raised in temperate latitude to tropical Dr. Patrick Manson seconded conditions. warmly the opinions and arguments of Dr. Sambon, and took the filarial blood worm, which is held to cause elephantiasis and other diseases peculiar to the tropics, as an illustration of how the discovery of the true pathology of a large group of maladies, constituting a powerful and extensive factor in deteriorating the health and damaging the constitution placed it within our power to prevent this particular noxa. How is this to be effected? You have only 'to keep the mosquito down ' or prevent mosquitoes from sucking the blood of filarial persons or prevent them from obtaining access to drinking water, or kill its larvæ in the latter by boiling or filtering.

Now filarial infection and its consequences is not, as far as the European is concerned, a very common or serious originator of ill health, and were the crusade against the mosquito as easy as Dr. Manson alleges, the gain to acclimatization would be very slender. The causation of filariasis, as expounded by Dr. Manson, has been known for about a quarter of a century, and it is very doubtful whether the prevention of a single case of chyluria, or elephantiasis has resulted from that knowledge; and if such be the case as regards an organism whose life history is so well known, and the conditions of whose existence are so easy of control, what of the numerous so minute, so multitudinous and so ubiquitous, causing disease and degeneracy, so serious in so many places and regarding whose life-history and the means of controlling whose propagation and dissemination men are so ignorant? Truly the problem of preventing physical deterioration of the European constitution, even granting that it is mainly or solely due to these parasitic organisms, is one of infinite complexity and difficulty. The fact is that the parasitic doctrine of disease causation, though it is not so formidable and hopeless as the dynamical, does not by any means place the possibilities of 'acclimatization of Europeans in tropical countries' within easy or early reach and practically it seems to matter little whether tropical heat acts injuriously by impairing nervous power and organic integrity directly or through the intermediacy and agency of parasites whose life and multiplication and power for harm are favoured thereby. The truth is that the European, especially the European child, grows anæmic, weedy, flabby, apathetic and asthenic in the tropics, and that the race deteriorates and dies out in the tropics; and whether this is caused by an uncongenial environment, or by diseases due to parasites, which find in the tropics congenial soil and surroundings, does not really seem to affect the

question of acclimatization materially. Drs. Sambon and Manson notwithstanding, this question seems for practical purposes, to stand pretty much as it stood before the revolution in doctrine which the establishment of the germ theory of disease has brought about. At the same time the discovery of intermediate and secondary causes is an undoubted gain both to science and to sanitation, and continued research on these lines cannot fail, in some measure and at some time, to prove fruitful.

Social Reform Section

THE WEST BENGAL HINDU MATRIMONIAL AND DIVORCE BILL

(Abstracted from a printed letter form, addressed to the Hon'ble Premier of West Bengal, and circulated.)

An Act to remove certain disabilities and doubts in respect of marriages between Hindus and to regulate marriages and to provide for a right of divorce among all communities and sections of Hindus in certain circumstances.

Preamble

Whereas it is expedient to remove certain disabilities and doubts in respect of marriages between Hindus and to regulate marriages and to provide for a right of divorce among all communities and sections of Hindus in certain circumstances,

It is hereby enacted as follows:-

Short title, extent and application

- 1. (1) This Act may be called THE WEST BENGAL HINDU MATRIMONIAL AND DIVORCE ACT, 1948.
 - (2) It extends to the whole of the Province of West Bengal.
 - (3) It applies to Hindus only.

Definition

- 2. In this Act, unless there is anything repugnant in the subject or context,
 - (a) 'Bigamous marriage' means the marriage of a person during the lifetime of his or her spouse, if the marriage of such person with such spouse has not been dissolved or declared void by a Court of competent jurisdiction, or is not void according to the custom or usage of the community or section to which either of the parties to such marriage belongs;

 (b) 'Hindu' includes a Sikh, Jain, Buddhist, a follower of the Arya or Brahma Samaj, and a convert to Hinduism:

 (c) The definitions in the Indian Divorce Act (Act IV)

(c) The definitions in the Indian Divorce Act (Act IV of 1869) shall apply.

Inter-caste marriage

3. Notwithstanding any text, rule or interpretation of the Hindu Law or any custom or usage, a marriage between Hindus, which is otherwise valid, is not or shall not be invalid by reason only of the fact that the parties thereto belong to different varnas, castes, communities or sections among Hindus.

Bigamous marriage when void

4. Notwithstanding any text, rule or interpretation of the Hindu Law or any custom or usage, a bigamous marriage shall be void if it is contracted in West Bengal after the commencement of this Act.

Marriage voidable in case of bigamy

5. Notwithstanding any text, rule or interpretation of the Hindu Law or any custom or usage, a wife may present a petition to the District Court or to the High Court praying that her marriage may be dissolved on the ground that the husband has another wife married before or after the commencement of this Act and living at the time of the institution of the suit.

Indian' Divorce Act to apply --

6. The Indian Divorce Act (Act IV of 1869) shall apply to all marriages among all communities and sections of Hindus, and any such marriage may be declared null or dissolved in the manner therein provided, and for the causes therein mentioned, or on the grounds mentioned in this Act.

Saving

- 7. Nothing contained in this Act-
- (a) shall apply to Hindus marrying under the provisions of the Special Marriage Act, 1872 (Act III of 1872), or
- (b) shall affect any right of divorce of judicial separation recognized by custom.

Current Topics, Etc.

Judicial Hanging

(From the British Medical Journal, ii, 13th December, 1947, p. 986)

Dr. J. R. V. Foxton (New Norfolk, Tasmania), writes: I was interested in the answer to the question on the above subject (26th July, p. 160), and in the comments of Col. Rutherford (16th August, p. 282). When a student at the Melbourne University, I attended a lecture on judicial hanging given by Prof. Frederic Wood Jones to a combined meeting of the Medical Students' Society and the Law Students' Society. If my memory serves me correctly he stated that the placing of the knot at the angle of the jaw (as is, I believe, the custom in British countries) rarely, if eyer, fractures or dislocates the vertebral column, and death in judicial hanging occurs from strangulation or from fracture of the base of the skull. In either case consciousness may be retained for some time and death occurs slowly and painfully. He further stated that invariable fracture or dislocation of the cervical spine could only be obtained (a) by employing a very long drop, approximately that required to produce decapitation, or (b) by the placing of the knot under the chin, in which position it must be retained by some mechanical appliance. It would appear that judicial hanging as practised is an unnecessarily cruel and barbarous form of execution, and that reform is long overdue.

Bestial Torture

(Reprinted from the Statesman, Late City Edition, Calcutta, Monday, 22nd March, 1948, p. 6, column 7, Letters to the Editor)

Sin,—I have seen no more revolting form of cruelty than the practice of vivisecting turtles in a Calcutta market. As its flesh putrifies rapidly, customers' requirements are met by slicing the desired quantity of meat from the living body. Unfortunately, turtles are exceptionally tenacious and, provided their heads are left intact, can hold on to life for hours with only half a trunk.

The morning I investigated the matter, a vendor had before him a turtle from which most of the hind-quarters had been cut. Unable to believe that this mangled mess still possessed life, I asked the vendor if it was dead. He assured me to the contrary, tapping the creature sharply on the head, and to my horror, it opened first a bleated eye and then its mouth. Other witnesses have told me that a freshly-opened furtle screams in agony like a woman.—Yours, etc., DAN HAZLEWOOD, Calcutta, 17th March.

Tortured Turtles

By A STAFF REPORTER

(Reprinted from the Statesman, Wednesday, 5th May, 1948, p. 10, column 1)

The West Bengal Government have issued a waining against subjecting turtles to torture. People are reminded that the practice followed in some Calcutta markets of cutting off slices of flesh from living animals is an offence punishable under the law.

Officers have been asked to take notice of this offence promptly and prosecute the offenders in court.

The Worshipful Society of Apothecaries

(Abstracted from the Medical Press, 31st December, 1947, p. 605)

A SPECIAL Court dinner was held in the great hall of the Society of Apothecaries on Tuesday, 16th December, to mark the 330th anniversary of the first meeting of the Court of Assistants.

of the Court of Assistants.

The Master, Professor E. C. Dodds, after proposing the Royal Toasts, gave the Toast of the City of London. In the course of his speech he said; in the course of his sp

'The apothecaries, prior to 1617, belonged to the company of Grocers, already by that time one of the most important of London's City Companies. The Grocers, however, took over the apothecaries, so to speak, from an even more ancient body, the Pepperers, who were a flourishing corporation as early as 1180. Together with the Corders, Farriers, apothecaries and others, the Pepperers allied themselves with the Spicers and formed the Guidd of St. Anthony. This body

later became the Grocers' Company.

'We can see that the apothecary was primarily a tradesman, but one dealing in a very highly specialized class of business, demanding special knowledge and skill, and it was therefore not unnatural that he should resent being subject to the control of the Grocers, whose business was far more general in scope. In addition to this, it is clear that by 1617 the apothecaries, or at any rate some of them, had begun to take on a more professional character, holding appointments at Court and visiting patients themselves, instead of merely dispensing the medicines ordered by the physicians. It was no doubt due to the influence of such men as Gideon Delaune, Apothecary to Queen Anne, the wife of James I, that the apothecaries gained their charter. James I evidently recognized their claim to independence, since he remarked: "Grocers are but merchants: the business of an apothecary is a mystery, therefore I think it fitting that they be a corporation of themselves".

therefore I think it fitting that they be a corporation of themselves".

'It was when the apothecaries began to take on a more professional character that they came into conflict with that august body, the College of Physicians. The College of Physicians, founded by Henry VIII in 1518, was given the right, along with the bishops of the various dioceses, to grant licences to practise medicine. Its members were, almost without exception, graduates of Oxford or Cambridge and many of them had also spent some years in study abroad. They were aloof, very tenacious of their privileges, and in the main more concerned with the whims and illnesses of princes

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than with the sufferings of ordinary people, which they were well content to leave to the humbler

apothecaries.

'In spite of the opposition of the College of Physicians, which it took them nearly 200 years to overcome, and of disasters such as the Great Fire of London in which their first Hall was destroyed, the apothecaries maintain their independence and to-day hold a unique place in the life of the community, since they are at one and the same time a City Company, with all its one and the same time a City Company, with all its ancient rights and privileges, and an association of professional men, granting licences to practise medicine in the same way as the two Royal Colleges.

'We have seen that our Society has its roots in the very ancient past, and this lovely old Hall in which we are assembled still speaks to us of the root.

we are assembled, still speaks to us of the past. Yet the Society itself does not dwell in the past; it plays its part in the present and looks forward to the future. It is significant that it should have gained its independence at a time when a new spirit of inquiry was animating the minds of men in general, a spirit awakened by the revival of learning and by the great discoveries beyond the seas, a spirit which was manifested a little later in the scientific discoveries of Harvey, Newton, Boyle and others, the same spirit which inspires all genuine scientific research of to-day.

'Our Society has played its part in the life of London through the ages. It has been buffeted about by mis-

fortunes as London has by fire and hombs, but, like

London, it remains.

The Lord Mayor, in replying to this Toast, said how much he appreciated the Society of apothecaries and the work which had been done in the past and the work it was now doing, especially in the Diploma

of Industrial Health.

Dr. Thackray Parsons, a past Master of the Society Dr. Thackray Parsons, a past Master of the Society, proposed the Toast of the Guests, in which he said: "It becomes no one to be bashful at table", so wrote Plautus and Juvenal, "that food and wine begot the Cdes of Horace". Therefore, I will neither plead bashfulness nor at this festal board, with "The champagne's foaming flow, The Master's lips aglow", can I plead hunger. I make no excuse for my inadequacy. Because we of the Society know there was reply one man who by virtue of office and attainments. only one man who, by virtue of office and attainments, by facility of informed speech, could do full justice to this historic night and to the guests so felicitously chosen by our Master to grace it. That man was Dr. Cecil Wall, our late archivist. The Fates have not willed it.

'Three hundred and thirty years! Hardly a page in the history of this city founded by Magog, the grand son of Noah, hardly a chapter in that of the apothecary, whose name takes us back to the store-rooms and shops of ancient Athens, redolent of the spices and perfumes of the East, and who remembers that the first anothecary was Venus bringing the herb dittany from Crete to loose the arrow from sore-wounded Aeneas. Had we here Odysseus with his filled trench, what a crowd of phantoms would be made visible, no wailing ghosts but happy spirits, singing from the Elysian fields. This night is full of memories to them as to us and will be added to those memories.
And they come: Erasmus, Sir Thomas More, the Harry: Shakespeare, Ben Jonson, Marlowe: Goldsmith, Keats and Smollett-a shining and garlanded host to welcome their guests.

And first our Lord Mayor and Sheriffs. Always we have been their loyal servants—not too eager to pay their levies of corn and money but ever ready to be grateful for any reduction. Always they have been our

sure buckler and defence.

'We welcome Sir Frederick Wells, Sir Leslie Boyce and Mr. Hammett at the beginning of the year of office and Mr. Hammett at the beginning of the year of onice they will adorn. All three of them have already done great service to the city. Sir Frederick has special links with us as chairman of a great drug-making company; and, as a painter-stainer, he leased us their Hall in 1621 for our meetings. We welcome our Bishop, whose Cathedral towers above and watches over us as its predecessor did over the Black Monks on the

foundations of whose guest-house this Hall rests. the days of destruction, its great cross, gleaming from the flames against billowing clouds of smoke, unbroken by the bombs, gave hope and comfort to the watchers on our roof. Under its agais we were preserved.

We, who are thralls of this city blended of romance and of pragmatism, greet one who has come from the green river of sun-baked Brishane, from the dream city of Wells with its magic swans. He is very close to us as visitor to Sion College whose junior dean is our Master's chaplain. We have many links with the Royal Society, once a not very distant neighbour. At least two of its Presidents, Samuel Pepys and Sir Hans Sloane, loved our Hall. Many of our members have been its fellows—the last and most illustrious our present Master.

Sir Henry Dale its past president—our gold medalist and Nobel Laurente—is very welcome.

Our founder, Gideon Delaune, was a remarkable man, apothecary to Anne of Denmark, inventor of a miraculous pill which brought him a fortune; he was 91, some say 97, years old at his death, and he had 37 children by one wife—to her I give some of the credit. We are very fortunate to have with us Captain Fauncede Launc—a direct descendant—still living at Sharsted Manor bought by one of Gideon's sons. Without him our tables to-night would be incomplete.

'In Sir Norman Vernon we are in the presence of one whose work and whose name are a hope and an omen of better things whenever a man asks for bread and is given-his ration. Only as a humble customer has the earth-bound unicorn visited the winged horses of the merchant-adventurer in the Baltic Exchange. But in the Baltic Coffee House you would often have found apothecaries consulting the physicians about their patients. And if a great man of the Exchange. striding to his high table, nodded to one of them he preened himself indeed. And so we are proud to have Sir Norman with us to-night.

'I have left myself no time to speak of our other guests Dr. Fox, editor of The Lancet, who so kindly finds space to record some of our doings; Dr. Gilpin; our new archivist; Dr. Bentley Purchase, who, if you die of violence within his domain, will set the hounds of justice upon the trail of your assailant to sacrifice him to your . . .; Mr. Walter Hedley, whose wit enlivens and whose learning instruct our law courts; Dr. Harold Cooper-a great traveller-one whose name is heard in the forests when men speak of timber; and the son of our past Master, Mr. Thomas Layton, who has chosen to follow Dionysos rather than Apollo.

We are privileged and happy to have them with us. 'Masters, Wardens and Assistants, the Toast is health, happiness, and long life to our guests. With the Toast I couple the names of Sir Henry Dale and Capt. Faunce-de Laune.'

Sir Henry Dale and Capt. Faunce-de Laune replied for the guests, and so ended a very pleasant and memorable evening which everyone present will remember.

Some Reflections on India

By J. LEIGH COLLIS, M.D., B.SC., T.R.C.S.

(Reprinted with the kind permission of Dr. P. D. Hooper, Editor, from the Queen's Medical Magazine, Vol. 41, February 1948, p. 24)

MINE was not a long stay in India. In all, I was sixteen months in the country, but it was an interesting time both medically and because great political changes were close at hand. I was a very interested and somewhat sympathetic observer, although I feel that it is. most difficult for an Englishman to be really sympathetic in the circumstances. One was found to identify oneself with the English ruler whose back they wished to see, while the daily newspapers contained such offensive remarks about our race, that one could not help but be irritated by them. -

Nevertheless, it was true that all the anti-British feeling was against the system of government, and not against the individual Englishman. To myself, as an individual, all my many Indian friends were most kind, and I shall always treasure memories of their

hospitality.

The educated Indians, with whom I mixed, are a highly intelligent set of people, so that it was easy to understand that the presence of foreign rulers with its inference that they were a backward race, was intolerable to their self-respect. They also felt that the government's interest ended provided law and order was maintained and vital services kept running. This, they regarded as being done in the interests more of British trade than for Indian welfare, which did not seem to them to be getting the really interested attention that would be given by people of their own race. The unfortunate incidents which had occurred from time to time, were to the forefront of their minds, as being the reasons why they wanted to have their freedom, but I always felt that it was really the stigma of having foreign rulers that they resented more than the way in which their country had been ruled. In fact I felt quite certain that the country was not being ruled wholly badly. It was clear that many things should be improved, but the problems were of the most difficult nature, and of such enormous dimension.

The widespread poverty is the thing that impressed me most on arriving in India. I landed at Bombay which is a fine city, but even there the crowded quarters are unbelievably crowded by our standards. As I saw more of the country, the low productivity of the land, and the methods of agriculture, made the poverty of the dwelling places, seem a natural result. The general effect is of miserable crops, and masses and masses of cattle hopelessly searching for a blade of grass. These are the problems underlying all India's difficulties, but what difficult problems to correct.

Irrigation schemes have done much, and can do much more. Education would make a vast difference, but the problem of religion is the greatest stumbling block. India has a fifth of the world's cattle, but owing to the Hindu religion, they are made unnecessarily unproductive, by the refusal to kill off any of them. These old cattle uselessly exist eating the available foodstuff, instead of providing meat for the population. Even their forces are not allowed to manure the land, as they are all collected, and used as a source of fuel.

One basis of all society is that the average member of society must produce more than he needs for his own requirements. This surplus is then available for the individual's own amusements, and to supply taxes for such purposes as education, roads, hospitals and

public services generally.

In India, the vast majority of the population appears to have no surplus at all, and in very many cases, it would seem they have a deficit. The result of this is that funds just are not available for the great changes that should take place. The only answer to this would seem to be that progress must be very slow. As religious change is also likely to be very slow, this would appear to make any faster progress quite imnossible.

It must be remembered that progress has been going on under the British influence. Education has been pushed, but as funds were short, it has been limited to only a part of the population. This has been a good start, and these enlightened people now make the next start, under Tradian control. step under Indian control possible. However, the farming population seems as vet to have been hardly touched, and their problem must now be shouldered.

In India at present, there does seem to be a general awakening, which is running narallel with their demand for independence. The first of this awakening are not very evident as vet, but I feel certain that they will be seen in art science, and industry, before long. Although I am confident that this is true, and although the Indian, as I have said, is an intelligent person, it is remarkable how sterile their minds have been in recent centuries. The British cannot be blamed for this situation. At least stable conditions have existed with the underlying revolutionary feelings which should have produced a fine mixture for original and creative thought and work. In any case, this sterility goes much further back than the British Raj. There were glorious days in the times of Elizabeth, when Akbar was ruling in Delhi, but the rule of the Grand Moghul, and especially the building of the Taj Mahal, appears to have been just a veneer on the surface of a mass of

Their real days seem to have been even earlier, in the time of Asoka 300 B.C., and perhaps the Imperial Guptas 300 A.D., which appear to have been the tail-end of great times stretching back to the early Indian

civilization.

These great changes of heart of a people seem to run in very long cycles, and are controlled by a multitude of factors, but it does seem that India is arising again. I see no short-cuts for her, and I am afraid some people in India will be disappointed when they come to realize this. Further, I do feel that the British have played their part in helping her back to her feet, and I would be the first to admit that this is only partly by the good we intended to do. . . . other part is by the stimulus that we have provided in their surge forwards for independence.

Reviews

SURGERY OF THE AMBULATORY PATIENT .-- BY L. Kreer Ferguson, A.B., M.D., F.A.C.S. Second Edition. 1946. J. B. Lippincott Co., Philadelphia and London. Pp. xxill plus 932, with 645 illustrations. Price, 72s.

A MOST excellent handbook for the general practitioner for reference in his office and for the younger surgeons in the outpatient department of a hospital. Almost every condition is dealt with with minute and clearly expressed details of the methods to be adopted for treatment. One learns how many conditions may be advantageously treated without hospitalization of the patient who would otherwise have required it. The text is copiously illustrated with clearly defined diagrams and pictures which almost render reading through the text unnecessary. From a casual observation the volume appears to be rather bulky but everything within it is valuable and not to be left out.

THE PSYCHOLOGY OF THE UNWANTED CHILD .-By Agatha H. Bowley, Ph.D. 1947. E. and S. Livingstone Ltd., Edinburgh. Pp. xl plus 112. Price. 6s.

In this readable little book the author presents a thorough study of the subject of the unwanted child. The problem of the unwanted child is really a difficult

Some sort of a house must be provided and affection somewhere must be found. Faith of some sort or other is also essential although it has been ignored by the

All child psychologists will do well to rend this little book and the author will do well to go into religion in her next effort.

A POCKET GYNECOLOGY .- By S. G. Clayton, M.D., M.S. (Lond.), F.P.C.S. (Eng.), M.R.C.O.G. J. and A. Churchill I imited. London. Pp. vii plus 111. Illustrated. Price, 16s.

THIS book contains 109 pages of packed information. Everything of gynecology has been described in pleasingly simple language. Obviously details and disputed points cannot find place in a book which is

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meant for the pocket. But essentials are all there. It will amply serve its purpose, viz, it will help students

It will amply serve its purpose, viz, it will help students who are revising for their examinations or general practitioners who require a quick reference book.

The few simple illustrations are well drawn and printed. The diagram showing the physiology of the reproductive system is instructive. The same remark applies to the peneil diagrams illustrating simple every-

day operations.

We have nothing but praise for this little book. We have, however, come across certain statements in the text which we cannot look over without criticizing. A 'high' vaginal swab (p. 88) needs clarification. If it is taken to mean a swab taken from the fornices of the vagina, the value of the information derived from the culture of such a swab is questionable. On page 81, in connection with the treatment of intermenstrual in connection with the freatment of intermensirual pain, 'ovarian sympathetic plexus' has been mentioned. A curious reader is at pains to know what is actually referred to. Is it the plexus surrounding the ovarian atteries or the abdominal acuta below the coliac axis? In connection with 'membranous dysmenorrhom' menstrual decidue has been written; we take 'decidua' is meant.

The printing and the get-up are both good. The size of the book though not promising to fit in an average pocket is very handy indeed.

M.S.

HE APPENDIX.—By R. J. McNeill Love, M.S. (Lond.), F.R.C.S. (Eng.), F.A.C.S. 1947. H. K. Lewis and Co., Ltd., 136, Gower Street, London, W.C.1. Pp. vi plus 198, with 54 illustra-THE Price, 12s. 6d.

A very well-written book giving almost all information one needs about appendix. It is given in an authoritative manner having considerable practical personal experience behind it. The question of immediate operation and expectant treatment is well and lucidly discussed and the balance in favour of the latter is well expressed.

L. M. B.

PRACTICAL ANÆSTHETIC .- By J. Ross Mackenzie, M.D., D.A., R.G.P. & S. (Eng.). Second Edition. 1946. Published by Ballilère, Tindall and Cox, London. Pp. xii plus 172. Illustrated. Price, 10s. 6d.

THE book deals with all the commonly employed THE BOOK dears with all the commonly employed anæsthetics used in general or special surgery and will appeal to all students of the subject. The medicolegal notes are important and valuable where duties and responsibilities in connection with administration of anæsthesia have been separately and lucidly stated. A separate chapter on post-anæsthetic complications and their treatment would have been a valuable addition.

J. C. G.

SHORT HANDBOOK OF PRACTICAL ANÆS-THETIC.—By H. Harry Price, M.R.C.S., L.R.C.P., D.A. (R.C.S.). 1946. John Wright and Sons Ltd., Bristol. Pp. iv plus 127. Illustrated. Price, 12s. 6d.

This is not a textbook but rather a commentary on anesthetics which are used in the present day with illustrative and informative anecdotes and practical tips. This book gives in a concise form relevant information and practical hints about the use of different anesthetics with scientific explanation of their mechanism of action. It is all the more valuable because it incorporates, in appropriate places, author's own views incorporates, in appropriate places, author's own views

based on mature practical experience as an anæsthetist. In chapter II while dealing with intravenous anæsthesia, author's experience and practical tips about evipan sodium would have been appreciated. Regard-

ing pentothal sodium he has not mentioned whether ing pentothal sodium he has not mentioned whether premedication with drugs like omnopen, morphine sulphate, etc., is necessary or not. Excepting a few such minor points, the book will be found a valuable guide and help for beginner and professional anesthetists and medical and nursing staff concerned. Chapter XI deals with fall of blood pressure occurring during anesthesia by different agents and is a very like the chapter of Chapter XII is a speciality of the valuable chapter. Chapter XII is a speciality of the book dealing with the difference between naval service and civilian operation cases.

J. C. G.

THE UFAW HANDBOOK ON THE CARE AND MANAGEMENT OF LABORATORY ANIMALS: WITH AN APPENDIX ON STATISTICAL ANALYSIS.—Edited by Alastair N. Worden, M.A. (Cantab.), B.Sc. (Lond.), M.R.C.V.S., A.R.I.C. 1947. Published by Baillière, Tindail and Cox, 7 and 8, Henrictta Street, Covent Garden, W.C.2, London, Pp. vvi Dies 262. Ulimetrated, Poles. London. Pp. xvi plus 368. Illustrated. 31s. 6d.

This book supplies a long-felt want. In it informa-tion is available on all small animals usually used in the laboratory. For bigger animals and others not commonly used references are provided. The second category consists of anthropoids, dogs, cats, horses, other ungulates, shrews, vampire bats, poultry, reptiles, marine animals and other invertebrates (leeches, earthworms and drosophila).

Accommodation, breeding and maintenance have been treated in detail. Special attention has been given to diets. Foreible feeding has also been described.

Anæsthesia and euthanasia of the laboratory animals by approved methods have been given. The anæsthesia for frogs is particularly useful, as this animal cannot be stunned easily. It becomes unconscious in a beaker of 1 to 2 per cent urethane solution, in about 5 minutes.

The least important part of the book is the appendix of 70 pages full of symbols, indices, formulæ and equations. Its main purpose appears to be the construction of top-heavy and lop-sided equations.

$$^{N}S(Y-\overline{Y})^{2} = ^{N}S(W-\overline{W})^{2} + ^{N}S(X-\overline{X})^{2} + 2^{N}S(W-\overline{W})$$

 $(X - \overline{X})$ (p. 303)

Such equations are not needed in biology. Mendel could not get his 3: 1 ratio exact in a whole life time: the nearest approach was 2.87:1. In working with plants or animals, 2.87=3. Even a larger \pm range is permissible.

For drawing conclusions the agreements or differences found in the experiments performed or observations made should always be such as to hit one between the eyes.

A few minor faults inseparable from a first edition occur: On page 53, for instance, the letters in the figures are small and in the legends capital.

The get-up, in view of the scarcity of paper, etc., is satisfactory and the price is reasonable.

A very useful publication.

S. D. S. G.

BOOKS RECEIVED

Immunity Bulletin: Synopsis of Researches at the Bengal Immunity Laboratory, Calcutta—May 1946 to April 1947. Published by the Bengal Immunity Research Institute, 39, Lower Circular Road, Calcutta 16.

Correspondence

MAHATMA GANDHI

(1)

During my intimate contact with Gandhiji for nearly 20 years, I had many occasions to discuss with him about diseases, treatment and doctors. He held the view that diseases are mainly due to non-observance of simple rules of health and its consequent deterioration. Then it was that he thought that a man should live 125 years and would only die when the organs get decayed. This being so, treatment in his view should be simple and as far as possible carried out with indigenous drugs which are available to the poorest. A doctor, according to Gandhiji, might be a great expert, might have the gift of diagnosing most difficult and complicated cases and prescribing the rarest drugs, yet he would be no doctor if he had no sympathy, if he did not possess the milk of human kindness to pacify panic and worry, to soothe the patient and give him encouragement and hope.

The low standard of health of an average countrymen of his distressed him, and in Wardha he started to put his scheme of medical relief and hygiene into effect.

B. C. ROY,
Prime Minister, W. Bengal.

CALCUTTA, 17th February, 1948.

(2)

The assassination of Mahatma Gandhi, apostle of peace and love, stunned not only any one particular individual but the whole world. During the past ages, never has an inhabitant of a 'Slave country' gamed such respect, fame and admiration in the world as Mahatma Gandhi. He was not only a great statesman or a political leader but a 'Leader of thought with a new message for all mankind'. Although he did not succeed in transforming the whole world, he did in India and elsewhere stir up the mind of every individual. It was Mahatma Gandhi's deep sense of unity with the poor, ignorant, naked and starving that made the entire world turn to him for guidance. It was Mahatma Gandhi's dream and life-long struggle to raise the downtrodden masses of India to the Nationhood of a free country.

While one and all of us know Mahatma Gandhi as a lover of humanity and working for National uplift, let us turn our attention to his ideas about the physical uplift of man. He believed in prevention more than in cure and his regulated life should be a lesson to all those who do not believe in prevention. As for his interest in medicine, he said in one of his writings as follows: 'I have always wanted to be a doctor but on making enquiries I learnt that I would have to do vivisection and that made me give up that idea'. Gandhiji did not believe in making animals suffer in order to keep men alive. Medicines which the poor could not have were of no use to him. The Mahatma was a great believer in Naturopathy. He wanted to see a Free Medical State Service giving relief to the rich and poor alike. This was Mahatma Gandhi, the Fakir of the East, who gave 'Bharata Mahta' her long-deserved freedom.

It is unbelievable that anyone would have the heart to point even a finger at him—leave alone the muzzle of a revolver—and yet he was killed by one of his own people for whom he dedicated his life and struggled to win freedom! Mahatmaji is no longer with us in a material form, but his Soul will always be there to guide our destiny and elevate mankind to the ideals of his dream!

K. S. MASTER, LIEUTENANT-GENERAL, Director of Medical Services, India.

New Delhi. 6th March, 1948. (3)

'How beautiful to see

Once more a shepherd of mankind indeed, Who loved his charge, but never loved to lead; One whose meek flock the people joyed to be,

Not lured by any cheat of birth, But by his clear-grained human worth, And brave old wisdom of sincerity!'

LOWELL.

History chronicles many tragedies but no death in living memory has caused so much pain to mankind as the assassination of Mahatma Gandhi has caused. This is not due so much to the fact that nations have been brought close together by modern inventions as because of the universal appeal of the gospel preached and practised by this great apostle or non-violence. The world needs peace, goodwill and concord among the nations as a matter of life and death. The subconscious aim of the endeavour of all civilized nations has been the friendly unification of humanity into one family and the development of a happy, healthy race of beings who can carry on their work with enjoyment and develop their lives to the uttermost on this earth. Wars cannot forge such a union. The appeal to force and the brute in man as in the last two world wars has not succeeded in achieving that aim. Mahatma Gandhi denounced material force and in its stead preached reliance on the old historic human virtues of goodwill and co-operation. The acclamation of praise for the task he had accomplished reveals the triumph of the good sense of mankind and of the public conscience and if genuine and could be conserved

augurs well for the future of our civilization.

India, at long last, discovered a leader suited to the genius of her people. He was Indian to the core and though no stranger to Western civilization, was never contaminated by its touch. He had a face and smile which disarmed suspicion, inspired confidence and radiated good will. He was a great worker; had prodigious faculty for performance. His mind mastered the problem of the nation; and as the problem grew, so did his comprehension of it. Rarely was a man so fitted to his mission. In the midst of fears and jealousies, in the Babel of counsels and parties, this man wrought incessantly with all his might and all his honesty, labouring to find what the people wanted and how to obtain that. It cannot be said there is any exaggeration of his worth. If ever a man was fairly tested, he was. There was no lack of resistance, nor of slander, nor even of ridicule. The struggle for independence called for the highest courage, resourcefulness, endurance and character. In thirty years—30 long years of suffering and struggle—his endurance, his fertility of resources, his magnanimity were sorely tried and never found wanting. By his courage, his justice, his even temper, his fertile counsel, his humanity, he stood a colossus among the fighters for freedom of his and other generations. He is the history of the Indian people of his generation. Step by step he walked before them; slow with their slowness, quickening his march by theirs; the true representative of this great sub-continent; an entirely public man; father of the nation, the pulse of 400 millions throbbing in his heart, the thoughts of

public man; father of the nation, the pulse of 400 millions throbbing in his heart, the thoughts of their mind articulated by his tongue.

It was the cherished wish of the Mahatma to study medicine when he went abroad, but deference to his dead father's wish and meek submission to the prevalent narrow religious orthodoxy made him abandon that idea. But all his life he maintained a keen interest in the healing art. Even as a practising barrister he obtained a part-time job for a year as a dresser and compounder in Dr. Booth's Mission Hospital. He organized an ambulance unit during the Zulu War in South Africa and also at the commencement of the World War I. He published a 'Guide to Health' which was widely read. Though he could not appreciate the highly specialized knowledge of the

scientific medicine of the day, his outlook on problems of health was quite modern. He realized that most mental and physical diseases tend to cure themselves and that only in a small proportion of cases expert medical attention is essential. He was a great believer in hygienic therapy which is founded on the recognition of the fact that the body tends to cure itself and that people recover from disease. The measures of the treatment are thus designed to supply the conditions under which they get well, to assist the body to cure itself and to minimize the effects of the disease. Such treatment includes rest, sunlight, bathing, fresh air and diet. Hence his advocacy of naturopathy. In spirit he belonged to the hippocratic tradition. He had that physician's love and compassion for the sick and suffering and also a firm belief in the healing power of nature. By his insistence on the observance of the laws of nature, plain living and clean thinking, he prevented many unscrupulous endeavours to foist on the people irrational systems of medicine.

Who does not see even in this tragedy so recent,

Who does not see even in this tragedy so recent, how fast the horror and havoc of the assassination are already blazing into the halo of martyrdom round the victim? For happier this fate than to have lived to be wished away, to have watched the decay of his own faculties, to have seen the proverbial ingratitude of statesmen, and to have seen mean men preferred. Had he not lived long enough to keep the greatest promise that ever man made to his fellow men, the emancipation of his people from centuries long bondage and exploitation? And what if this heroic deliverer could no longer serve us; the task to which he dedicated himself is accomplished and what remained to be done required new and uncommitted hands—a new spirit born out of titanic struggle, and 'God, wishing to show the world a completed benefactor, shall make him serve his country even more by his death than by his life'. May his Soul rest in peace.

T. S. TIRUMURTI.

STANLEY MEDICAL COLLEGE, MADRAS, 12th March, 1948.

zin "u aren, 1948.

(4)

I am most grateful to the Editor of the Indian Medical Gazette for giving me an opportunity to write a few lines about Mahatma Gandhi. His assassination has been a great shock not only to India but to the whole world. He was looked up to as a great teacher and a saint by every one. He had an ideal character and his mouth always spoke the truth. Wickedness was abomination to his lips. It is very rarely that a man of this type is born into this world and it will be centuries before we will get a similar character anywhere in the world. The only person one could compare Mahatma Gandhi to is Jesus Christ. Their teachings are very similar. They led the same simple kind of life and they both left an inheritance to the world and they were both bold in their righteousness and every word they uttered was good and pure. Mahatmaji led an exemplary life and was a shield to every one that put their trust in him. He was one of the humblest of men who never spoke untruth or half-truth and was always prepared to face death and could rightly say 'O' Death where is thy sting? O' Grave where is thy Victory'. One can safely say that till Mahatmaji returned from South Africa and started on his life's work in India, India had no self-respect. Every Indian was badly treated both in his own country and outside. Gandhiii taught us self-respect; he taught us that we are human beings and deserve the same treatment as anybody else. The medical profession in our country owes a great deal to him. It is the indirect result of his work that we are to-day able to have an independent medical profession to follow our own lines as far as teaching, research, etc., are concerned. Till we achieved our independence, till we achieved our independence.

the control of the officers of the Indian Medical Service. We know how the Indian medical profession was kept under by these officers. One of the results of independence has been the abolition of a service which in truth did hardly any good for this country. The medical profession has come into its own now and now we can safely push forward for our advancement. India is full of medical talent in every branch of the science. If we stand together and work for the advancement of medical science, I feel confident that the day will soon come when medical men from other parts of the world will have to come to India to learn new progress in the science.

It is tragic that a life so valuable and so precious to us should have been snatched away by the hand of the assassin. It would have been good for that man if he had not been born. If Mahatma Gandhi had time to say anything, I am sure he would have said 'God, forgive this man, for he does not know what he is doing'. We shall not forget Mahatma Gandhi's name for generations to come and I can only end this short note by saying 'His name liveth for ever more'.

P. V. CHERIAN, M.B.B.S., F.R.C.S. (Edin.).

MEDICAL COLLEGE, MADRAS, 8th March, 1948.

(5)

If Mahatmaji is recognized as a great sage in the political and economic fields, there have been a few whisperings that in the field of Medical Relief and Public Health he was no supporter of modern advances and was rather antiquated in his views. In the following few lines it will be the writer's privilege to show from his own casual contacts with the Mahatma how utterly ill-founded such a view is.

2. It was the writer's great privilege to meet the Mahatma soon after his release from the Agakhan Palace in Poona—a release which Anopheles culicifacies brought about more readily than the cumulative sacrifice of the political patriots of the country! The particular specimen of Anopheles culicifacies collected from the place of his detention almost the day after his release and found infected with plasmodial sporozoites is treasured in our laboratory as an object worthy of being preserved in the national museum of the country. During my first contact with the Mahatma I referred to it and said that perhaps that was the insect which gave malaria to the Mahatma. With a characteristic smile, all his own, Mahatmaji replied 'Perhaps the insect got malaria from me!'

3. It may interest the readers of the Indian Medical Gazette to know that the writer has it on a most unimpeachable authority that Mahatma Gandhi's wit and humour were even more sparkling than ever when the thermometer registers a couple of degrees above normal. I have it also on equally good authority that a few grains of quinine controlled his primary attack of falciparum malaria which gave rise to high fever for two or three days. No further anti-malarial drug was taken. Nor did any relapse occur. He was considered to be a parasite museum with plasmodia, ankylostoma and amæba and yet the recovery from such infections was as remarkable in rapidity as the great stamina with which he sustained all of his epochal fasts.

4. When the writer had the privilege of meeting the Mahatma for the second time, a scheme of Comprehensive Malaria Control in more than thousand villages of Dharwar and Kanara districts had been sanctioned by the Government which then consisted of the Advisers to the Governor. I referred to this scheme and was obliged to repeat a conversation I had earlier with Dr. Sushila Nayar that if the Congress Government came into power in Bombay I would request my Health Minister to invite Mahatmaji to bless the scheme but if, by ill-luck, this was not to be and the Advisers' regime continued I would ask my

Adviser to invite His Excellency the Viceroy to inaugurate the scheme! Bapuji burst out laughing and in that moment I felt that the scheme was already blessed. Later when there was a discussion about the ethics of mosquito control I pleaded that spraying D.D.T. in one's own household was like putting a barbed wire fencing around one's compound and that if the thief scaled the fencing during his nefarious pursuit and got bleeding injuries the house-owner was not guilty of committing *Himsa*. The mosquito could feed from other sources. If it was so blood-thirsty as to get into human houses it has itself to blame in getting hurt. While the Mahatma seemed to accord his laughing approval to this view I was convinced that he intended to convey to me 'Why such special pleading? I can certainly appreciate a good cause'. In fact the last words of his blessing during that interview were 'Malaria Control is indeed National Service'. How true and how pithily expressed in the Gandhian way!

- 5. My great sense of shame during these brief but, to me, momentous occasions, was my utter inability to talk in Hindustani, a defect which was so forcefully brought home to me by Mahatmaji commencing the conversation in perfectly correct Tamil.
- 6. Later I had an occasion to visit Sevagram, along with Dr. Jivraj Mehta and other friends, when the question of the general sanitation of Sevagram was discussed. After a full discussion with technical experts Dr. Jivraj Mehta led us to Mahatmaji and expounded in a few minutes the result of our discussion. Mahatmaji agreed to the malaria control scheme and when it came to the question of choosing the best type of latrine in rural areas, he interposed a remark as regards septic tank latrines that people might put in disinfectants into the septic tanks in ignorance of the mode of their action. Again when a technical expert in the exhuberance of his technical competency interposed in the discussion and after a little while he referred to the need for converting step-wells into draw wells in order to eliminate 'hook-worm disease', Mahatmaji was the first amongst us to interject, 'You mean guineaworm disease!' Who can now charge Mahatmaji with lack of knowledge of the fundamentals of Medicine and Public Health? of Medicine and Public Health?

D. K. VISWANATHAN. B.S.Sc., M.H.P. (Hopkins).

MEDICAL EDUCATION

Sm,—For several years past minds have been exercised over what they think is the unsatisfactory nature of the curriculum of medical studies. This has been caused partly by the rapid recent advances in medical sciences, economic considerations as to how the course of studies may be brought down to the minimum period of instruction, the feeling that a considerable number of students take up medical studies for which they are not suited, the opinion of those who are politically minded and hold that the medical teaching institutions should turn out more qualified medical men to supply the need of the country, the insistence of specialists who wish very specialized subjects to be included in the general curriculum of studies and lastly by the activities of a certain number of persons who would like to be prominent in voicing their own opinions whatever may be their value.

If we consider carefully without giving importance to the causes mentioned before, we find that a medical man should possess the following qualities when he is passed out fit to be in charge of patients:

(a) He should possess a sound basic knowledge, acquired by practical training, of the different branches of medicine, which is required of a "general practitioner".

(b) He should possess a scientific mind and common sense so that he can readily make up his mind about his task.

(c) He should have sympathy and welfare of humanity at heart, along with scientific knowledge

that he has acquired.

(d) He should feel the highest respect for his profession the duties of which he will discharge

with integrity and prestige.

To attain these ideals not only his medical college but also the institution in which he has studied previously are contributing factors. Thus, if we find defects we must also look back to the earlier training of the students who take up medical studies. And when we are reorganizing the medical curriculum of studies we must ask for reorganization of the earlier studies as well. Lately it has been discovered that students enter the medical colleges very poorly equipped in the knowledge necessary for medical studies.

It will be interesting and helpful to consider the conditions which prevailed for a long period before changes began to creep into the curriculum of medical studies in the university. Taking the University of Calcutta as an example, for a long time the curriculum extended to five years of study following the Intermediate studies in Arts and Science. When this was drawn up the Intermediate Examinations in Arts and Science gave a very comprehensive training in the English language, a classical Indian language, Indian and English history with some Greek and Roman history, mathematics, logic, physics and chemistry. The comprehensive courses of study fitted the student to decide for himself the choice of his future career. Having gained this knowledge he was also fitted to take his medical studies with intelligent interest. In the medical college he studied in the first two years the preliminary scientific subjects, viz, botany, zoology, physics and chemistry and also got acquainted with anatomy, physiology and materia medica. The preliminary scientific subjects not only taught him many things he needed in his regular medical studies but also moulded him to take to his studies with precise and scientific methods. At the end of two years he was tested in these subjects and then had a whole year left to him to intensify his studies in anatomy, physiology and materia medica and towards the last three months of the year he was made to attend the clinical wards of his hospital in order to see how his knowledge in these subjects bore on the study of clinical material. One will notice here that three years were devoted to the study of anatomy, the most important basic subject in medical studies for the pundits who were in power realized that a thorough knowledge of anatomy was absolutely essential. During these three years every student dissected the human body twice so that there may be no excuse of having missed anything in that subject. At the end of the third year he had to undergo a test in these three subjects and if successful launched out to the study of medicine, surgery, obstetrics and gynæcology, pathology, hygiene and medical jurisprudence which covered a period of two years during which the student was always in the clinical wards of his hospital, in the post-mortem room or in the pathological laboratories. This curriculum remained in force for several decades and appeared very satisfactory; there was not a voice reised against it. On factory: there was not a voice raised against it. On the other hand most of those who are now raising their voices for a change were themselves trained in that manner and were afterwards accepted as successful men in their profession. During these decades advances in the knowledge of medical subjects went on increasing and even then it was not found necessary to change the curriculum of studies. For these decades were peaceful and without any global upheaval and men were stiffed with the progress of galaxy in its ordinary satisfied with the progress of science in its ordinary way. With the advent of a general unrest and over-specialization of the art and sciences of the different branches of medicine, very special knowledge of the different specialized subjects appeared necessary so that the student began to be burdened with these specialized details which were undertaken at the expense of the





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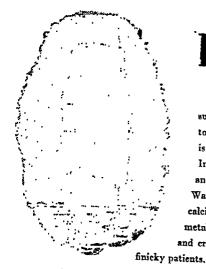
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It would be of real advantage if the premedical subjects were again taken on by the medical colleges and the old time-table of a 5-year course of study re-introduced.

The Intermediate Examination in Science should be the minimum qualification for a candidate for entry into a medical college, but its standard should be raised and the subjects taught in it should be more varied and comprehensive, thus giving the student a far more general knowledge than he has at present.

Teachers in medical subjects on the clinical side are numerous but very few are obtainable for the teaching of anatomy, physiology and pharmacology. The reason is obvious. Those who take up as their life work the teaching and research work in these subjects do not find attractive emoluments and security of tenure in these appointments in our medical colleges. A very great drawback in these appointments is the system of 'contract service' which has been left as a legacy by the British rule and which the present administration is following blindly chiefly for reasons of economy. Under this system a teacher is appointed for a period of years—usually a maximum of five—on a fixed salary which is far from adequate with a proviso that the services may be terminated on six months' notice and no prospect of the services being extended for a further reasonable period without going through the process of a Selection Board interviewing candidates invited by advertisement. Such insecure conditions do not favour the formation of a group of scientific medical men who are ready to devote their life to teaching and research work in these important subjects.

In the clinical subjects, most teachers are eminent men in their own line with high academical qualifications and large experience. They enjoy the privilege of private practice which very often clashes with their duties as teachers. Most of them are inadequately paid and in some teaching hospitals most of them work in an honorary capacity. Thus they have to find means by private practice of living according to the social position they occupy. If it is expected that they should devote a large part of their time to teaching and hospital work, they should be remunerated adequately so that they may not have to run about to earn their living by private work. It means a heavy outlay and it is worth while if the desired end is to be obtained. In a like manner the teaching colleges and hospitals should be generously equipped and the necessary recurring expenditure should be assured. Most of the private and semi-private teaching institutions are badly starved for funds and it is a wonder how they have been able to maintain their existence so long. This should be remedied speedily. Though the generous public have been very considerate and have come forward to build up these private and semi-private institutions, they have now begun to feel that the state must be responsible for their adequate maintenance. Too much red tape and individual idiosyncrasies of officials have stood in the way especially when the latter are given to exercise authority and power in dictation and laying down the law.

This should be done away with and all matters dealing with the question of medical grants by the government should be dealt with by a small board of expert non-officials after full discussion and their decision should have peremptory effect on the smaller official department.

Recently there has been a great deal of agitation for the creation of a post-graduate college. All the discussions, surveys and investigations lead to the one question and that is that there should be a sort of a centre where graduates will receive intensive guidance of higher degrees. The value of a really lies in providing a centre where graduates will receive refresher instruction in order to keep them abreast of the latest advances in the sciences. If, however, the primary object is limited to that of creating an institution for higher degrees the value of

tions is very much narrowed. Regardless of the object the inception of an institution, separate from the teaching hospitals for undergraduates, is creditable and noteworthy and its development will depend on experience and results. There is one side which has to be taken into serious consideration and that is that already there is a large number of men with higher foreign and Indian qualifications in our country; most of them find difficult outlet for their activities and consequently become discontented. The creation of a coaching school for higher degrees will add to their number and if at the same time facilities for them are not multiplied there will be a serious 'unemployment' problem facing us.

All these questions involve a vast outlay in money and if the country is able to meet that it is obligatory for the State to undertake it. But before taking new schemes in hand the starved existing teaching hospitals should be put on their feet.

Yours faithfully, AN EDUCATIONIST.

ERRATA

THE cc., c.cm., MIL., mil., AND ml.

In the heading of the last Editorial (June issue) for 'c.cm' read 'c.cm'.

Also on page 282, in first column, first para, line 2, for millimetre read millilitre.

Publishers' Notice

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles are entitled to receive 25 reprints gratis; additional reprints can be obtained on payment. No reprints will be supplied unless contributors ask for them at the time of submitting their manuscripts.

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Original Articles

REPORT ON THE EPIDEMIC OF ANTERIOR POLIOMYELITIS IN THE NICOBAR ISLANDS

By S. H. MOSES, KT.H., M.B., BS., BSSC., D.T.M. (Cal.) Officer in charge, The Wynaad Malaria Field Station. Kalpatta P. O., Wynaad, Malabar District

THE Nicobar group of islands lies in the Bay of Bengal between the 6th and the 10th degrees of latitude (north) and between the 92nd and the 94th degrees of longitude (east), 75 miles south of the Andaman group of islands.

The Nicobars consist of 20 islands out of which 12 only are inhabited. The total area of all the islands is 635 square miles, the seaspace occupied by these islands is 163 miles X 36 miles (5,868 square miles) and the area of the populated islands alone comes to 627 square miles. A map of the islands is appended to this report. At the time of the 1941 census the total population of all the islands was found to be 12,447 (6,586 males and 5,861 females). About two-thirds of the whole population live The area and in the Carnicobar Island. population of the islands according to 1931 census are furnished in table I.

TABLE I Statement showing the area and the population of the Nicobar group of islands according to 1931 census

Serial number	Islands	Aica, square miles	Popu- lation	Density per square mile
1 2 3 4 5 6 7 8 9 10 11 12	Carnicobai Chaura Teressa Camota Kalchal Nancouni Trinket Great Nicobar Little Nicobar Bom-Poka Kondul Pulo-Milo	49 3 34 58 62 19 6 333 58 4 0 5	7,492 615 437 548 317 201 65 300 57 105 45	153 205 13 95 5 106 11 09 098 26 90 86

Climate.—The mean temperature at 8 a.m., and the mean maximum and the mean minimum temperature readings for the twelve months of the year recorded at Carnicobar are furnished in table II. The temperature varies very little during the year. The mean maximum varies from about 85°F. to 90°F. and the mean minimum from 75°F. to 77°F. The range of diurnal variation of temperature is also small. It is from 8°F. to ,13°F. being greatest in the

month of April and least in December, and January.

TABLE II

Statement showing the mean temperature at 8 a.m. and the mean maximum and the mean minimum temperature readings recorded at Carnicobar

	Темп	ERATURE (IN	°F.)		
Months	Mean (at 8 a.m.)	Mean maximum	Mean minimum		
January February March April May June July August September October November December	80 81 82 83 81 81 81 81 80 79 79	85 87 89 90 87 86 86 86 85 85	77 77 77 77 77 77 77 77 76 76 76 76		

Humidity.-The relative humidity and wet bulb temperature at 8 hours local mean time are furnished in table III. As in the case of temperature the variation is small. Because of the warm humid climate people cannot do hard work continuously. As both men and women have to do work, they both have a tendency to be bare-bodied above the waist. Many men wear only a T-bandage or something of the kind.

TABLE III Statement showing the relative humidity and wet bulb temperature at 8 hours local mean time in Carnicobar

M	onths	Relative humidity (per cent)	Wet bulb temperature (in F.)	
January February March April May June July August September October November December			78 77 78 81 89 88 88 89 90 92 88 81	76 77 78 79 79 79 79 79 79 79 79
Average for	THE YEAR		85	78

Rainfall.—The average rainfall and number of rainy days in Carnicobar Nancouri are furnished in table IV. It can be said that there is rainfall throughout the year, the relatively rain-free months being January, February and March. Recording of rainfall, temperature and humidity has not yet been started after the liberation of these islands from the hands of the Japanese and figures for the year 1947 are not available but I understand from Captain N. C. Bhowal, Assistant Surgeon on special epidemic duty at Carnicobar, that in November and December 1947, the months in which anterior poliomyelitis occurred in epidemic form in these islands, there were very few rain-free days in Carnicobar.

Table IV

Statement showing the average rainfall in Carnicobar and Nancouri Islands

		Carnic	COBAR	Nancouri			
Months .		Rainfall in inches	Rainy days	Rainfall in inches	Rainy days		
January February March April May June July August September October November December		4.5 1.3 2.2 4.2 12.1 12.5 10.1 9.8 13.2 11.5 11.5 8.6	5 2 3 6 14 15 13 15 15 15	2.8 1.9 2.3 4.8 13.5 12.7 11.7 11.5 14.2 13.5 11.9	8 4 5 10 20 20 20 20 20 20 20 19		
TOTAL FOR A YEAR.		101.5	124	114.3	183		

Communication between villages.—The villages in most of the islands are situated along the sea-coast and excepting those in Carnicobar and a few others, they are not connected by roads. But there is free communication through the sea, the islanders using outrigger canoes for the purpose.

Housing conditions.—Most of the dwelling houses consist of a single room about 16 feet imes 16 feet or 20 feet imes 20 feet. The floor of the house is about 5 to 8 feet from the ground level and is supported on strong pillars, sometimes provided with circular discs to prevent rats entering the house. The floor is made of strips of wood or bamboo reapers. Most of the houses have no side walls but the dome-shaped thatched roof takes the place of side walls as well and touches the floor of the house. There may not be any opening at all for free ventilation but in some houses an opening on a ridge is provided in the roof for smoke to escape when the hut is used as a kitchen also. The entrance to most of the houses is through the floor and a removable ladder is kept for getting in and out of the house. Three or four families with about 20 to 30 persons may sleep inside such a house and if friends and visitors arrive they will also be

accommodated inside the same onegladly roomed house. The ventilation and floor space are quite insufficient for the number of people occupying the house and the habit of living and sleeping together with friends and relatives under such conditions of overcrowding and poor ventilation cannot fail to cause a high incidence of communicable diseases especially those caused by droplet infection. Respiratory diseases and enlarged tonsils and adenoids are very common in the islands and almost all the children breathe through the mouth, and as a result develop a peculiar appearance with prominent mouth and teeth and a poorly developed nose. It is possible that if their housing conditions are improved even the facial appearance of the race will be changed. Small-pox, chicken-pox, measles and similar diseases can do great havoc to the people if introduced into the islands when they are non-immune, as they appear to be now.

Water supply.—The Nicobarese usually drink only the water from the tender cocoanut and they do not feel the need for a protected water supply. There are some small wells from which they get the water for cooking and washing purposes.

Diet.—Milk of cows, goats and buffaloes is not used by the Nicobarese. Cocoanut milk is used in cooking. Yam and pandanus form the chief source of carbohydrates, and fish, chicken and pork form the chief source for proteins. Papaya and plantain are freely used in the diet.

Communication with the other parts of the world.—The Nicobar group of islands has been cut off from the rest of the world and has been in partial isolation for a long time. Excepting a few traders who have their agents in the Nicobar group of islands and few government servants very few people visit these islands. S.S. Maharaja, the government chartered ship, goes near the islands on its way to and from Madras once in three months, and two or three government servants may be left in or taken away from the islands.

The islands were under the Japanese occupation from August 1943 to November 1945 and the R.A.F. opened an observation camp in June 1947.

Previous history of epidemics.—The people of the islands state that anterior poliomyelitis was unknown to them before 1947 and there is no old cripple to prove the contrary.

Some of the older people of the islands can recollect an epidemic of influenza that did great havor in these islands just after the 1914-18 world war. That epidemic had a very rapid spread in these islands and in 3 or 4 weeks there were about 300 deaths in a population of about 10,000 spread over about 600 square miles of land and 5,868 square miles of sea-space. The rapid spread of the influenza epidemic and the epidemic of anterior poliomyelitis with the apparent synchronism, i.e. the disease occurring almost at the same time in different islands, has added strength to the belief of most of the people in these islands

that the diseases must have been due to the

visitation of some evil spirits.

The cpidemic of anterior poliomyelitis in Carnicobar islands.—On 12th November, 1947, a female, aged about 22, who had been undergoing treatment for conjunctivitis as an out-patient in the civil hospital at Carnicobar for about 4 days, was noticed to have fever and she developed difficulty in breathing and died suddenly. There was another case of sudden death on the 14th November, 1947, and two cases on the 16th. As the place was endemic for malaria and these deaths were quite sudden, the patients dying soon after admission, a definite diagnosis of anterior poliomyelitis causing paralysis of respiratory muscles could not be made. But when more cases were seen, especially cases with paralysis of limbs, etc., the diagnosis was clear and by that time the fact that the island was having anterior poliomyelitis in epidemic form was also realized.

There were many cases with paralysis of the respiratory muscles and many died in their houses before they could be removed to the hospitals. By 30th November, the total number of cases of anterior poliomyelitis admitted in the hospital reached 471 and by the 10th of December, the figures went up to 824 and later on the epidemic gradually tailed off to one case per day on 25th and 27th December, 1947, and 3rd and 15th January, 1948. Graphs showing the admission of cases by dates are appended.

Besides the cases admitted in the hospitals there were 103 deaths in the villages due to this

disease and many mild non-paralytic cases and a few paralytic cases did not care to get admitted in the hospital. There were 118 deaths in hospitals and the total deaths come to 221. Thus there were 976 attacks and 221 deaths within a period of 65 days between 12th November, 1947, and 15th January, 1948. Of the total of 976 attacks 307 were non-paralytic cases and the remaining developed paralysis. Of the paralytic cases 206 were found to have made complete recovery, 221 died and the rest had varying degrees of residual paralysis.

The age group of the cases both non-paralytic and paralytic and fatal cases admitted in the hospitals are given in tables Va and Vb. The diagnosis of anterior poliomyelitis was made in the non-paralytic cases by Colonel Capila, I.M.S., by keeping the patients under observation for about 10 days. Out of 566 cases that developed paralysis in the Carnicobar Island 50

Table V
Statement showing the highest and the lowest annual rainfall in Carnicobar and Nancouri

	Station	Mean rainfall in inches	Highest in inches	Lowest in inches	
1 2	Carnicobar	101	126	65	
	Nancouri	114	163	79	

Table Va

Non-paralytic cases admitted into hospital

-								1			
Age groups		0-2	3-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	Total
Males Females Both sexes	•••	12 14 26*	29 20 49	47 30 77	30 25 55	21 21 42	9 9 18	7 23 30	3 2 5	3 2 5	161 146 307

^{*}This figure includes 1 male and 3 female children about 9 months old.

Table Vb

Paralytic cases admitted into the hospital—attacks and deaths—distribution in various age groups in both the sexes

Age groups	0-2	3-5	6-10	11-15	16-20	21-25	26-30	31–35	36-40	41-45	Total	Per- centage	REMARKS
Attacks in males Attacks in females Attacks, both sexes Deaths in males Deaths in females Deaths, both sexes Percentage of deaths to attacks, males. Percentage of deaths to attacks, females. Percentage of deaths to attacks, both sexes,	26 3 2 5 20 18	54 28 82 8 4 12 15 14	74 50 124 15 7 22 20 14	54 42 96 11 4 15 20 10	46 50 96 14 14 28 30 28	63 38 101 16 11 27 25 29 27	18 14 32 4 4 8 22 29 25	7 0 7 0 0 0 0 0 0 0 0 0 0	1 0 1 1 0 1 100 0 1 100	1 0 1 0 0 0 0	333 233 566 72 46 118 22 20 20.8	58.8 41.2 100.0 61.0 39.0 100.0	

per cent were males and 41 per cent were females. The total population of the island consisted of 4,374 males and 4,348 females (in 1946). Only 41 per cent of the total number of cases occurred in children below 10 years. 34 per cent occurred among those between 10 and 20 years; 23 per cent occurred among those between 20 and 30 years; and only about 2 per cent occurred among those between 30 and 45 years. Out of 118 deaths analysed, about 46 per cent occurred among those between 1 and 15 years and about 53 per cent among those between 16 and 30 years. It will be noticed that only the age groups susceptible to get tonsillitis got the infection. The educated and the uneducated, the clean and the unclean, the intelligent and the stupid, the strong and the weak, the rich and the poor, all were affected without any discrimination. Some young men with excellent physique who had been very good football players and wrestlers also were affected.

In the Carnicobar Island there are 15 villages as shown in the map. The number of cases admitted from these villages is given in the table with the dates on which the first and the last cases were admitted into the hospital (table VI). On enquiry in the villages it was found that there were one or two fatal cases in some of the villages before the first hospitalized case. The epidemic spread to all the 15 villages in about 18 days as known by the dates on which the first case from each of these villages was admitted. The interval between the first admitted case and most of the later cases in these villages was shorter than the usual incubation period of the disease, and most of the cases appeared to have got the infection from a common source or different sources and not one case from the other, of the same locality. There were many cases with interval of 2 to 3 days and the first crop of cases merged with the second crop. Only in a small proportion of the cases in a locality there was an interval of about 3 weeks between cases. The average interval between the dates of admission of the first and the last case from a village comes to 24 days. The infection appears to have stayed longest in Perca, the village which got the infection first.

Incidence in houses.—In Carnicobar 3 or 4 families live and sleep in the same house though the joint family may have 2 or 3 houses in their possession. In a large joint family of 97 members there were 25 cases; all occurring within a period of 4 days. Most of the houses had more than one case but the interval between cases in most of the houses was only 2 or 3 days. Only in a few houses the interval between a few of the cases was about 3 weeks. In some houses children who were nursed by the mothers incubating the disease till the date of the onset of the disease were found to be healthy. No case was reported to have a second attack.

Some Nicobarese who attended on patients and carried them were found to develop the disease later on.

		[1106	., 1948
	Remarks		
	Total	4,374 4,348 8,722 333 233 566 72 46 118 161 161 161 873	: ;
Cases of anterior poliomyelitis admitted into the hospitals from the nillanes of Carnicolar.	Titup	107 208 10 10 10 10 10 10 10 10 10 10 10 10 10	30th Nov. 21st Dec.
	Sawi	397 797 797 797 60 72 72 80 80 80 80 80 80 80 80 80 80 80 80 80	29th Nov. 15th Dec.
	Arong	258 2777 235 29 20 20 20 113 113 114 114 115	24th Nov. 14th Dec.
	Vy Curry Kemios	234 233 473 473 22 22 11 12 13 41 11 25 66	25th Nov. 7th Dec.
	Malacca Kakana	234 202 436 436 46 23 69 14 17 17 18	25th Nov. 18th Dec.
	Malacca	3337 356 356 253 253 450 450 553 333 553 553 553 553 553 553 553 5	24th Nov. 12th Dec.
	Perca	342 383 225 225 225 225 235 24 24 24 25 25 25 25 25 25 25 25 25 25 25 25 25	12th Nov. 15th Dec.
	Tamalu	341 354 695 88 88 16 16 88 16 60 30	24th Nov. 19th Dec.
	Kanvaka	237 210 244 117 111 28 12 12 12 24 24 25	27th Nov. 13th Dec.
	Chukehucia	310 308 618 618 10 10 119 13 32	23rd Nov. 9th Dec.
	Tapoimin	158 165 323 323 14 6 6 20 3 10 10 9 9	20th Nov. 12th Dec.
	Lapatti, small and big	684 607 1,291 35 23 58 58 74 11 11 24 13 35	22nd Nov. 17th Dec.
	Kinmai	208 208 416 117 128 6 4 4 2 119 433 757	28th Nov. 12th Dec.
	Mus	227 1,068 1,068 277 73 13 13 15 15 99	21st Nov. 27th Dec.
	Names of villages	Male population Female population Total population Faralytic attacks, male Paralytic attacks, female Paralytic attacks, female Paralytic attacks, both Sexes. Deaths, male Deaths, female Deaths, both sexes Non-paralytic male Non-paralytic female Non-paralytic and Non-paralytic female Non-paralytic and non-paralytic female Non-paralytic and non-paralytic female Non-paralytic and non-paralytic female	Date on which first case was admitted. Date on which hast case was admitted.

The source of epidemic.—A Nicobarese adult, Machar by name, about 35 years old, belonging to Perca village of the Carnicobar Island had been to Port Blair in the Andaman Islands in connection with his cocoanut business. When he was at Port Blair he had fever and was admitted in the Port Blair Government hospital. He was an in-patient in the hospital from 20th September to 2nd October, 1947. He had fever with chill and pain all over the body. The blood showed no malarial parasite but he became all right after taking quinine and mepacrine for 6 days. He came back to Carnicobar on 5th October, 1947, and underwent treatment in the Civil Hospital in Carnicobar for tapeworm. The earliest cases of anterior poliomyelitis in Carnicobar occurred in and around his house. The first recognized case, the girl with conjunctivitis who died in the hospital, belonged to his house. On enquiry in the village it was found that a niece of Machar had died suddenly a few days earlier than the recognized case, probably due to the same disease. Perusal of hospital records at Port Blair showed that there were probably a few cases of anterior poliomyelitis in Port Blair. When Machar was in the hospital at Port Blair a co-patient in the hospital who was admitted on 29th September, 1947, with pain in the chest and all over the body and dyspnæa died on 30th September, 1947, of respiratory paralysis, probably due to anterior poliomyelitis. It is probable that Machar got the infection when he was at Port Blair and had a mild sub-clinical attack about two weeks later when he was at Carnicobar, or became a carrier and infected the relatives who fell victims to the disease and in addition passed on the virus to others to create a widely spread carrier condition in the island. When enquired Machar stated that after his arrival from Port Blair he had not been keeping good health, but the illness did not force him to remain in bed. When he was in the hospital at Port Blair, another Nicobarese by

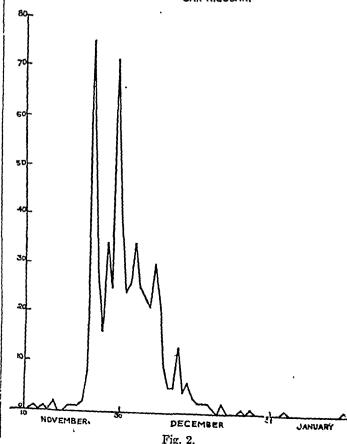
NON PARALYTIC CASES ADMITTED IN HOSPITALS. CAR NICOBAR 30 20 10 " NOVEMBER DECEMBER

Fig. 1.

name Moses belonging to Carnicobar who had been to Port Blair to study laundry work from the hospital dhobi used to visit him in the hospital. He also returned to Carnicobar on

5th October, 1947. Nancouri Island .- On 14th November, 1947, when 2 or 3 unrecognized cases had occurred in Carnicobar, a boy named John, 8 years old (belonging to Mus village in Carnicobar Island and a next-door neighbour to Moses who had returned to Carnicobar from Port Blair with Machar), went to Nancouri to visit his friends and relatives. He arrived at Nancouri with slight fever and the next day developed paralysis. As this type of illness with paralysis was unknown in the island, most of the people of the village assembled together and began to pray for his recovery. About 2 weeks later 4 people in that locality developed anterior poliomyelitis within a period of 3 days. They belonged to different houses in the same locality. One of them a female about 20 years old, who had visited John when he was ill, developed paralysis of all the limbs. John made a complete recovery. A child about 4 years old got both the lower limbs paralysed. The remaining could walk about with a limping gait. There was no death due to the disease in this locality, which consisted of 3 hamlets and in one of them there was a shop belonging to an

> PARALYTIC CASES ADMITTED IN HOSPITALS CAR NICOBAR.



Indian merchant, the only supplier of clothes and provisions to the whole of the southern and central group of the Nicobar Island. People from the other villages of the Nancouri Island and from the villages in the other islands nearby used to bring their cocoanuts to this shop and exchange them for cloth and provisions and this movement of the people helped the dissemination of the virus. The infection spread very quickly from village to village and from island to island but subsided abruptly, there being no case after the beginning of January 1948. In Nancouri, Camota, Trinket and Kalchal islands with a total population of about 1,200, there were about 98 cases with paralysis and 29 deaths. As the islands are highly malarious and filariasis is also prevalent the exact number of non-paralytic cases could not be determined. About 25 gave history of fever with pain in the limbs at about the time of the epidemic. Probably there were more non-paralytic cases.

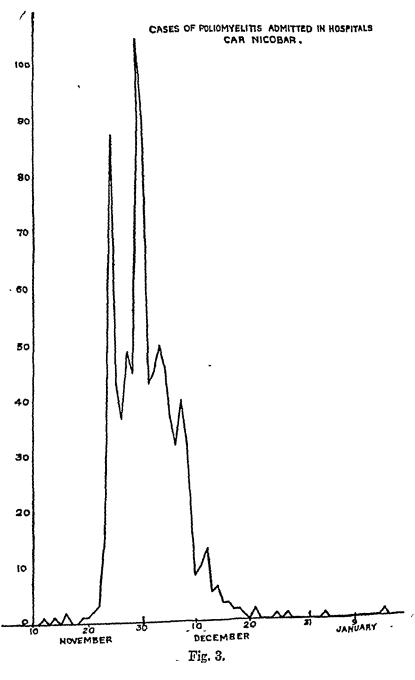
In this group of islands, the houses are not so very overcrowded and less number of families live in each house. Hence the number of cases per house was only one in most of the houses, though the proportion of the number of cases to the total population works out to be the same, i.e. about 123 cases for a population of about 1,200, i.e. 1:10.

Chaurs.—This island lies between the Nancouri group and Carnicobar. It was believed in Carnicobar that the Japanese had an isolation camp in these islands and that ever since the Japanese occupation there had been cases of anterior poliomyelitis in this island and that Carnicobar must have got the disease from this island. But when the island was visited it was found that this island also had the disease in an epidemic form by the end of 1947. It was further stated by the islanders that the disease was unknown to them previously and that it broke out only 2 or 3 weeks after the return of a batch of the islanders from Carnicobar to which place they had gone for purchasing knives, cloth and other articles. This island with a population of about 1,200 had about 45 cases with paralysis, of which 30 died. The exact number of non-paralytic cases could not be determined.

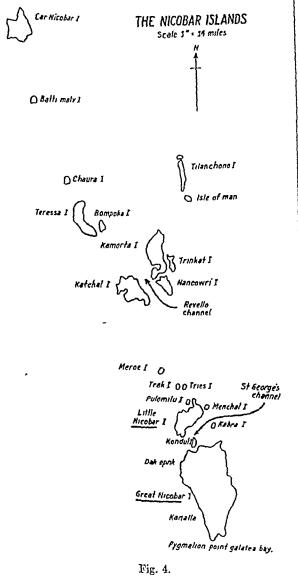
Port Blair.—The population of Port Blair consists chiefly of Indians and the communication with India is good. S.S. Maharaja, the government chartered steamer, plies between Calcutta and Port Blair about twice a month and there is good movement of population between Port Blair and India. In December 1946, a case of anterior

poliomyelitis appears to have been admitted and treated in the Women and Children Hospital and there appears to have been no other subsequent cases in the locality excepting a Nicobarese woman who happened to be The rest of the population at Port there. Blair appear to have been resistant to the infection. In September, October, November and December 1947, there appear to have been a few sporadic atypical cases mostly without residual paralysis. As the people of Port Blair appear to have some immunity against the disease, the disease has not taken an epidemic form. It is very hard to say whether Port Blair is endemic for the disease or whether it gets infection from the mainland every year.

General features of the epidemic in the Nicobar Islands.—As the Nicobarese did not have any acquired immunity against the disease (as they had been living in isolation almost cut off from the rest of the world, not having any opportunity



to get exposed to the infection), when the infection was introduced about one-tenth of the population developed visible signs of the disease. It is very hard to say whether the virus has got itself established in these islands and will hereafter give rise to sporadic cases or whether it will fail to do so. There may not be such an epidemic in the near future as the population left behind is probably immune now.



The virus appears to have been introduced into the Carnicobar Island on the 5th October, 1947, but the first visible manifestations that the disease was there were noticed only by about the middle of November, the next month. By the time the first cases were noticed the disease had spread widely, probably carrier condition had been widely established and probably there had been many missed cases and certainly about 300 people were incubating the disease, and one such person incubating the disease had left the island to spread the infection in the Naucouri group of

islands and others had carried the infection to Chaura. Hence, even if the cases and immediate contacts of cases had been well isolated though further spread from these persons alone could be checked, the spread of the virus itself could not have been checked. It is very difficult to find out all the carriers and isolate them and it is equally difficult to know all the contacts of the case during the infective stage which includes the last few days of the incubation period when the would-be patient would have been mingling with the people and probably travelling from place to place.

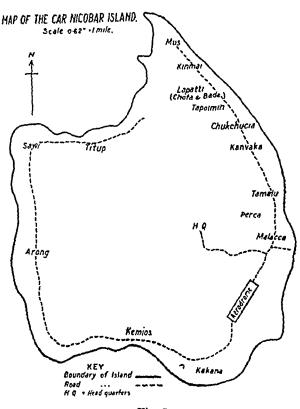


Fig. 5.

Only Nicobarcse developed visible signs of the disease. Though there were about 50 Indians in these islands none of them developed the disease. All the Indians were adults and probably had acquired immunity. The epidemic spread rapidly and it came to a close suddenly. This kind of sudden stopping of the epidemic and limitation to a particular season have made some epidemiologists think that the disease might be carried by an insect and that was the reason why the disease is strictly limited to certain seasons like other insect-borne diseases. But in the case of anterior poliomyelitis it looks probable that the disease spreads rapidly over the whole of the population in a very short time. All the susceptibles develop the sign of the disease within a short period and then there is no more visible evidence that the virus is present in the community as the rest of the population is resistant to the disease. The virus itself may live in the community for some time more or for ever.

The probable mode of spread: (1) Water.—
The people of these islands do not resort to wells or any other common source of water supply for their drinking water. They chiefly drink tender cocoanut water and their technique of cutting the cocoanut and drinking the water directly from the cocoanut makes chances of the disease spreading through this vehicle very remote. They use water from wells only for washing and cooking purposes.

(2) Milk of animals.—Milk is very rarely used by the people, and it does not form a probable vehicle of infection. Other articles of food are plantain, papaya and cooked yam and pandanus which cannot carry the infection so very widely.

(3) Flies.—When the epidemic was in full swing there were very few non-rainy days and flies were very few in number. Flies began to appear in large numbers only after the epidemic had subsided.

In a community living widely scattered in different islands spread over a sea-space of 5,868 square miles, the disease has travelled along with the movement of people and rapidly spread like an epidemic of influenza. The people have no common source of water supply or food supply. Droplet infection from carriers, ambulatory cases, persons incubating the disease and persons actually suffering from the disease appears to have played the chief part in the spread of the disease. It has been said that the virus is a neurotropic one. This may not be strictly and essentially so. Probably it multiplies in the mucous membranes of the pharynx and gets itself broadcast along with the secretion of the nose, pharynx and mouth. If the virus can multiply only in the anterior horn cells of the spinal cord and other nerve cells; the spread of the disease from man to man will be very difficult and should take more time. The virus has been demonstrated in the stools of patients, carriers and convalescents. The virus found in stools has produced the disease in monkeys but how far the virus found in the stools will produce disease in man and cause epidemic remains to be seen. If the disease spreads through the virus present in the stools only such a rapid spread in a community which does not have a common source of water supply or food supply may not take place. Probably the virus can exist in the mucous membranes of the nose, pharynx and the alimentary canal but spreads widely from throat to throat by droplet infection and only in some individuals under certain unfortunate circumstances enters the nervous system and give rise to trouble. It may be that in communities in which it has existed for some time it will cause paralysis only in a few unfortunate children. It may not also be in the interest of the virus to get itself bottled up in the nervous system of

It will be interesting to study whether the virus has died out in these islands or whether it

is still alive and may give rise to sporadic cases with paralysis. It will be good to keep the islands under close observation and be on the look out for cases. If special observation staff cannot be posted instructions may be issued to the village captains to be on the look out for fresh cases and to send immediate report to the Assistant Commissioner of Nicobars when cases occur. The people also may be instructed to give immediate intimation to the captains when there are cases. There is no regular communication between Carnicobar and the rest of the Nicobar Islands and it may not be possible to send information quickly to Carnicobar from the other islands. At least Carnicobar may be kept under close observation. Though the island must be watched carefully throughout the year special attention will have to be paid during the months of September, October, November, December and January.

Summary

1. The virus was introduced into the islands from Port Blair.

2. Though the virus was introduced into the Carnicobar on the 5th October, 1947, the earliest cases could be detected only by the middle of the next month, i.e. November 1947, and by that time the virus had widely spread in the island and about 300 people were incubating the disease and a very wide carrier condition also had been probably established and a boy incubating the disease had left the island for Nancouri and others had carried the infection to Chaura.

3. The infection spread widely in a short time and appeared to be highly communicable and the mode of transmission was probably

by droplet infection.

4. In urban areas and other regions which have been in association with the virus for some time multiple incidence in institutions and families are rare because of the general non-susceptibility of the population. But the virus may spread widely all the same and how far the virus has spread may not be known as most of the people will not develop the disease in spite of receiving the virus because of their non-susceptibility.

5. In an area cut off from the rest of the world and where people have not developed immunity to the disease the highly communicable nature of the virus is clearly seen by the occurrence of large numbers of cases dis-

tributed over extensive areas.

6. As the virus spreads rapidly and covers in a short time the entire groups of population in communication with one another, cases occur only for a short time, as all the people get the infection in a short time. Hence the epidemic appears to be limited to a short period.

Acknowledgments

Thanks are due to the Chief Commissioner, the Deputy Commissioner and the Senior Medical Officer

of Andamans and Nicobar Islands and Assistant Commissioner, Nicobar Islands, for making the investigation in these islands possible, to Capt. N. C. Bhowal, Assistant Surgeon, Port Blair, who accompanied me and was of great help during the investigation, and to Mr. Y. M. Jadwat, Carnicobar, for sparing his cargo boats on two occasions for visiting some of the islands of the Nicobar group free of cost.

EXTRAPLEURAL PLOMBAGE WITH LUCITE SPHERES

By N. L. BORDIA, M.D. (Madras), F.G.C.P. (U.S.A.)

Indore

ALTHOUGH it is still not possible to estimate with any accuracy the exact incidence and mortality of pulmonary tuberculosis in India, it is a common observation that the disease is very prevalent and is increasing especially in the large towns. The migration of village populations to cities, rapid methods of communication, industrialization, lack of adequate diet, extreme congestion, improper sanitary conditions ignorance have all added to the 'piling up' of the rate of tuberculosis. The available institutional beds for isolation or treatment are very few and their mere doubling or tripling will not solve the problem. Organized home treatment has made little impression in solving the problem congested towns. Whatever beds are available are occupied by patients who must stay for many months before they can be expected to leave the sanatorium or hospital with safety. There are a few centres which undertake surgery, but, in many instances, lack of properly trained staff is obvious. As the acute forms of tuberculosis are common, most patients must await a 'cooling off period' before a surgical procedure, such as thoracoplasty, can be undertaken. Such patients occupy the available bed space for years.

Obviously, there is need for a procedure which will provide earlier control of the disease with as little risk as possible. Many patients are fearful of two- or three-stage operations which to them are drastic and deforming procedure. Local anæsthesia as commonly practised is not painless; complications, spread and mortality are still considerable; and the post-operative course is hazardous. While blood transfusions and the use of cyclopropane and complex gas anæsthesia are the routine in many countries, they are not in use in India generally. With these facts in view, the procedure outlined below is of real appeal and deserves to be extensively used in the management of pulmonary tuberculosis, partic-

ularly under Indian conditions.

Apart from the surgeon's operative skill, little special attention is required since other skilled personnel is not essential. Difficulties encountered during the procedure and complications resulting therefrom are hardly significant. The period of hospitalization is reduced and the patient can even convalesce at home, inasmuch as further skilled attention is not strictly

necessary. Spread of disease, post-operative debility and anæmia are minimal. If artificial pneumothorax has been tried and failed, thoracoplasty has been the method of choice for

the control of an upper lobe cavity.

The author has had the opportunity of assisting in and following a number of cases of extrapleural plombage with lucite spheres. Its applicability is far more extensive than thoracoplasty. In India, it is usual to resort to ambulatory pneumothorax due to lack of available beds. In many large hospitals in India, a patient is admitted for pneumothorax treatment in a tuberculosis ward. He is detained for about a month and if pneumothorax has succeeded, the patient is discharged and attends the outpatient department for refills. If pneumothorax fails, he is discharged and is advised to continue rest at home or to go to a sanatorium. In the latter instance, the waiting time for admission frequently is four months or longer. Extrapleural plombage could be done in such cases and the need for hospitalization should not ordinarily extend the original stay materially.

Extrapleural plombage is not a new procedure and has been known to the medical world for almost as long as any collapse measure. It was first introduced by Tuffier in 1891 in France. Various substances have since been used to fill the extrapleural space, notably fat, muscle, gauze, rubber dam, paraffin, celluloid, mineral oil, rubber balloon, etc. Mayer in 1913 used air (extrapleural pneumothorax). Before the last war, a large number of reports appeared in the medical press on extrapleural procedures, especially with

pneumothorax.

With the advent of antibiotics in the field of medicine the plombage operation again began to be used more frequently and the danger of pyogenic infection has been considerably reduced. The other disadvantages of paraffin plombage and activities pneumothorax with air or oil continued to cause hesitation in their use, though these have been the only procedures still occasionally used. The remainder of the plombe substances have been abandoned almost entirely.

The following criteria are listed in the section of a material as the ideal plombage substance:

1. Should be readily available and not be too expensive.

- 2. Should cause little significant tissue reaction.
- 3. Should be light in weight but stable in body.

4. Should be easily sterilized.

- 5. Should be preferably roentgenologically visible.
- 6. Should be insoluble in body fluids and non-absorbable.

There has long been a search for a suitable plombe substance, the search extending into the fields of orthopædic and cranial surgery. The use of methyl methacrylate (lucite) was reported by Wilson in 1943. Solid spheres, one

inch in diameter, were first utilized but due to their excessive weight, they were replaced by hollow balls. At the time of this report lucite has met the requirements of the ideal substance to a large extent and has been tried principally in the United States by Wilson and McCain and at the National Jewish Hospital by Dr. John The lucite spheres are very light in weight and readily sterilized by immersion in 1:1,000 mercuric cyanide solution overnight. This method of plombage is comparatively recent but apparently has eliminated most of the disadvantages attending previous extrapleural procedures.

Indications

In general, it may be stated that this method of extrapleural plombage is advocated to replace the two- to three-stage modern thoracoplasty except where contra-indications exist. It has also the following special indications when thoraco-

plasty cannot be attempted.

1. Type of disease: A patient with comparatively recent disease can be subjected to this operation. Cases may be selected with a recent cavity about 3 cm. in diameter at most, preferably situated in the centre of the lung and above the third rib anteriorly or sixth rib posteriorly. Mild associated toxemia is no contra-indication.

Young patients and women on whom other measures are not desirable such as thoracoplasty, or those individuals above 50 years of age or with limited respiratory reserve such as associ-

ated asthma or emphysema.

3. Control of intractable hæmorrhage from a

known source as an apical cavity.

4. Presence of disease in other lung when thoracoplasty cannot be done.

Pregnancy complicating tuberculosis.

Contra-indications

Extensive lesions with diffuse caseous infiltrations or large-sized cavities extending below the hilar region.

Extensive fibrotic disease and rigid, walled, single or multiple cavities where even thoraco-

plasty will probably have no effect.

3. Diffuse granular lesions or large nodular

lesions.

4. Lesions accompanied by purulent pleurisy. It is presumed that no free pleural space exists and artificial pneumothorax has been tried.

Technique of operation

Pre-operative preparation.—Patient receives 1½ gr. of nembutal on awakening and 50 mg. of demerol, one hour before operation. The operation is done preferably in the afternoon so that the bronchi are cleared of secretions. In such cases patient can have a light meal in the morning, 4 hours before the operation. Other pre-operative preparations are those of major surgical procedures.

Anatomy.—Outside the pleural space and the parietal pleura and lining the thoracic wall, there is a layer of loose areolar tissue which forms the endothoracic fascia. It is stronger above than below. Near the dome of the pleura it is strengthened by the cervical fascia lower down it becomes continuous with the fascial plane of the mediastinum. When the extrapleural space is sought, one goes through this fascia and outside the parietal pleura. There are a few blood vessels and bands traversing this space which are torn across during the process of cleavage. When there has been any significant inflammation in the pleura the adhesions become dense, it is difficult to find a plane of cleavage and there is risk of tearing the pleura and lung. There may be quiescent tuberculous foci as a result of previous disease and these may become reactivated resulting in infection of the space. A superficially situated cavity underlying the space may derive its blood supply from the chest wall and these vessels are divided during the process of cleavage. It is believed that in certain instances the cavity wall may become necrosed and break into the extrapleural space with the development of empyema.

Anterior approach.—Patient lies flat on the with head slightly raised. General anæsthesia with cyclopropane is induced (open ether or novocain ½ per cent with adrenalin local infiltration anæsthesia can be substituted). An incision about four inches long along the anterior axillary fold is made in order to expose the pectoralis major. The pectoralis major is The pectoralis minor is retracted medially. divided transversely. The ribs with intercostal muscles are exposed. A section of the second rib (two to three inches long) is resected subperiosteally, a small nick is made in the bed of the rib periosteum and with blunt dissection (a very small sponge on a hemostat) the extrapleural space is sought. Once a small area of cleavage is found, it is expanded by blunt sponge on a holder. A head lamp focused into the wound or a light carrier previously sterilized can be used as a retractor of lung and illuminator. There is some oozing of blood which is best checked by gently packing the entire space with a hot sponge for a few minutes. The pack is removed and the whole space is carefully inspected and lucite balls put in one by one until the space is uniformly filled. Usually about 20 to 25 spheres are required depending upon the size of the chest and the extent of décollement done depending again on the extent of the disease. The extrapleural space is closed by cotton sutures. The divided pectoralis minor is sutured. The skin and fascia closed by interrupted cotton sutures. Penicillin (200,000 units) is left within the space while closing.

Post-operative care.—Patient lies on the operated side (healthy side up) turned from side to side every two hours to prevent accumulation of bronchial secretions. He is supported to sit up and allowed to

cough and expectorate.

Oxygen, blood transfusion or other infusions are not required. If there is much pain complained of, sedatives are prescribed. Penicillin is given for seven days, 200,000 units every day. The lucite balls make a crackling sound for three or four days due to friction but as the exudate forms on the outside of these balls, no further sounds can be heard.

Post-operative complications

1. Fluid accumulates in the space but is absorbed within two weeks and usually needs

no aspiration.

2. Traumatic pneumothorax with fluid has been observed, obviously due to tear in the pleura, and needs no special attention. It soon gets absorbed but if the quantity is large, it can be aspirated repeatedly.

3. Fluid may form in the subcutaneous tissue, but is absorbed without interference.

Surgical emphysema or infection of the intrapleural space is rare. Spread or activation of disease in the other lung is likewise not common.

Post-operative febrile reaction always occurs but subsides in three to four days and needs no treatment.

Pressure on veins or mediastinal structures and rupture of cavity have not been encountered.

Post-operative course.—Patient is free of all symptoms of the surgical operation very quickly and feels well the very next day. He eats well, sleeps well, and pain is not significant. Sputum is considerably reduced. He is kept on bed rest for about a week depending on the condition and then gradually allowed to move about. It is usually difficult to persuade the patient to rest and there is a persistent desire to be up and about. The period of stay in the hospital is considerably reduced. The positive sputum is converted into a negative one much earlier than after a thoracoplasty.

Radiological appearances after operation.— The roentgenogram shows lucite spheres as multiple round shadows resembling cystic disease above the selectively collapsed lung. Some quantity of exudate is visible for about two

weeks within the extrapleural area.

One of the difficulties in assessing results is the fact that roentgenogram does not help to identify the cavity, as the lucite balls throw multiple shadows circular in shape overlapping one another. Conversion of sputum from positive to negative is the correct criterion for the assessment of closure of cavity and control of disease.

This method of plombage has been in use for only three or four years and sufficient time has not elapsed to evaluate the long-term results. It may be extremely useful in the management of tuberculosis treatment in India. The ease with which it can be undertaken makes it suitable for the conditions we live in. I believe it will replace thoracoplasty in the vast majority

of cases and will be applicable to most of the cases attending the tuberculosis institutions in India, where nothing else may be done with safety. Many institutions, which cannot undertake the treatment of tuberculosis properly, should be able to do so with reasonable chances of recovery.

There are other plombing substances on trial like polyethelene and other plastic materials and they may prove more suitable than lucite.

Case presentation

White female, age 38, had had a chronic protracted disseminated tuberculosis for the past 20 years. Early in the history was a right pleurisy followed by a severe laryngeal tuberculosis. This required tracheotomy and the insertion of a tube which she has worn since. Associated with this was evidence of bilateral upper lobe tuberculosis. Over the next few years there were periods of good health interspersed with hospital care for sacro-iliac tuberculosis on one occasion, and nephrectomy for right renal involvement on another. Sputum became persistently positive in the past year and in spite of bed rest, cavity persisted in the right apex. Extrapleural stripping with insertion of 26 lucite spheres was done with almost no reaction (figures 1, 2 and 3, plate XVI). Postoperative course was uneventful except for a temperature to 100.2° for three days. The sputa have been persistently negative almost immediately after surgery.

ANEURYSM OF THORACIC AORTA

By A. K. NANDI, B.Sc., M.B., LR.C.P.S., M.R.C.P. (Edin.)

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During my 18 years' practice I have come across only 5 cases of aneurysm of thoracic aorta and I think the disease is extremely rare in Bengal. The diagnosis is mainly from x-ray examination as the symptoms and physical signs are often very vague and ill-defined. I give here a brief résumé of these 5 cases with special reference to a case of double aneurysm which was lately admitted in my ward. As double aneurysm is still very rare a detailed description has been given.

Case 1.—A male, about 50 years old, complained of severe pain in the back, duration about 3 months. The pain was very much aggravated at night and he had to pass almost sleepless nights. Build plethoric. B.P. 160/90 mm. Hg. On physical examination no other abnormality was detected except slight hypertrophy of the left ventricle and slight dullness over the lower part of the left back. W.R. moderately positive. Radiograms of spine and chest were taken. The former was normal but the latter revealed an aneurysm of descending thoracic aorta close to the diaphragm.

Anti-syphilitic treatment by arsenic and bismuth and administration of potash iodide in gradually increasing doses completely relieved him of his pain and he was free from symptoms for one year after which he was lost sight of due to my transfer.

Case 2.—A female, about 65 years old, mother of 13 children, complained of paroxysmal attacks of dyspnœa and tachypnœa and occasional severe pain over præcordium, duration about 2 years. She consulted me when she noticed slight blood in her sputum. Build good. B.P. normal. There were dullness below left clavicle and scattered râles and rhonchi in both lungs, more marked in the left, and expiration was prolonged. The apex of the heart was slightly displaced down and out and there was no abnormal pulsation nor any murmur. Examination by radioscopy revealed an aneurysm of the transverse arch of the aorta. W.R. was negative. The patient died of severe hæmoptysis about a week

Case 3.—A male, about 58 years old, complained of dyspnæa on exertion and pain in the right chest, duration about 6 months. sometimes very severe at night. Build thin, prominent distended veins over the upper part of the chest and slight cyanosis of head and neck. There was slight bulging over the right 2nd interspace which was very tender. There was a diffuse impulse over the bulging which was dull to percussion. There was no murmur, but aortic 2nd sound was accentuated. B.P. normal. W.R. negative. X-ray examination revealed an aneurysm of the ascending part of the arch of aorta.

The patient gradually went downhill and died of cardiac failure in the course of four months.

Case 4.—A male, about 48 years old, complained of dyspnœa, cough and slight hoarseness of voice, duration about 2 months. Cough generally dry with occasional muco-purulent expectoration. There was also irregular temperature. Build thin. Spleen slightly enlarged. B.P. rather low. Heart normal. Breath sounds were very much diminished over left lung which on percussion seemed to be rather hyperresonant. Both V.F. and V.R. were absent. A provisional diagnosis of pneumothorax was made but on radiographic examination aneurysm of transverse arch of the aorta was detected. W.R. was positive. The patient could not be kept under observation as he left my treatment.

Case 5.—A male, 56 years old, was admitted in my ward on 11th June, 1947, with the following complaints:

1. Constant pain in the sternal region and right side of chest and occasional severe pain in the left side of the back, duration about 3 months. Pain particularly worse at night, interfering with his sleep.

the discomfort in and Palpitation præcordium, duration about 3 months.

3. Cough with scanty expectoration, duration about 2 months.

The above complaints came on insidiously and progressed gradually and he did not undergo any treatment prior to his admission.

Previous history.—Exposure at the age of 15. History of present condition.—Nothing particular, no addiction to alcohol.

Family history.—Patient had one son and two daughters, all healthy.

On examination.—Build strong, nutrition rather poor. Slight anæmia and slight cyanosis of head and neck. Pulse 80 per minute, waterhammer character, regular. Arterial wall not thickened. B.P. 115/45. Respiration 27 per minute. Teeth and gums unhealthy. Voice husky. Pupils unequal, left pupil wider and not responding to light. No tracheal tugging and no ædema of extremities.

Cardio-vascular system.—Face suffused, pallor and cyanosis present. Slight clubbing of fingers; visible carotid pulsation; engorged neck veins and enlarged veins over the chest; abnormal visible pulsations of almost all superficial arteries. A localized bulging, about the size of a duck's egg, present over the right 2nd and 3rd intercostal space, painful and tender. It was pulsatile and on palpation a forcible, heaving and expansile impulse was felt and diastolic shock was present. On percussion it was dull and the dullness was continuous with the area of cardiac dullness. On auscultation, both systolic and diastolic murmurs were present. The apex of the heart was in the sixth space just outside the mid-clavicular line and on auscultation systolic and diastolic murmurs were heard all over the præcordium.

B.P.—Right arm: 115/45; left arm: 115/45; right thigh: 115/45; left thigh: 115/50.

Alimentary system.—Nothing particular. Respiratory system.—Moist râles all over both the lungs.

Other systems.—N.A.D.

Provisional diagnosis.—Aneurysm of aorta.

Skiagraphy of chest.—Showed double aneurysm of the aorta (see figures 2 and 3, plate XVII) though detection of 2nd aneurysm was not possible from clinical examination.

Blood for W.R.—positive.

slight picture—all normal except Blood anæmia.

Blood urea—55 mg. per 100 c.c.

Blood NPN-49 mg. per 100 c.c.

Blood cholesterol—180 mg. per 100 c.c.

Urine and stool—N.A.D.

Funduscopy.—Blood vessels seen but not pulsatile or tortuous.

Laryngoscopy.—Vocal cords normal; laryngitis

present. Electrocardiography.-Left axis deviation and

gross myocardial damage.

Treatment.—Apart from absolute rest in bed and other symptomatic measures the patient was put on iodide in increasing doses, then mercury

PLATE XVI -- EXTRAPLEURAL PLOMBAGE WITH LUCITE SPHERES : N. L. BORDIA. (O. A.) PAGE 363



Fig. 1.—Before lucite

Fig. 2.-After lucite.

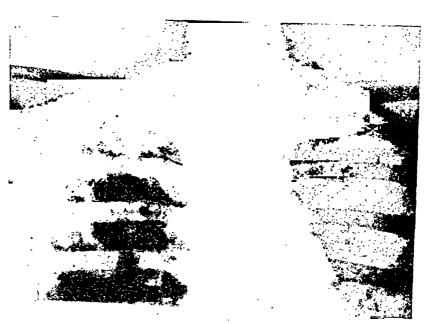


Fig. 3.



Fig. 1—Photograph of case V. Note.

1. Swelling over the upper portion of light chest; 2. Œdema of upper extremities; 3. Engoiged neck veins.



Skiagram of case V. Antero-posterior view · Showing double aneurysm of aorta.

Fig. 3.—Skiagram of case V Lateral view: Showing double aneurysm of norta.

PLATE XVIII

LYMPHADENOMA OF THE SALIVARY GLANDS: B. P. TRIBEDI & A. R. ROY. (O. A.) PAGE 367



Fig. 1.—Case 1. Showing the gross appearance of the tumour.



Fig. 3.—High power view of figure 2 showing the details. Note the absence of any cilia.

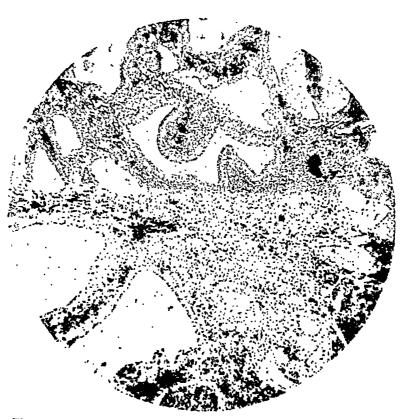


Fig. 2.—Case 1. Low power view of the sections of the tumour showing the lymphoid stroma and dilated glands containing cheesy material.

PLATE XIX

LYMPHADENOMA OF THE SALIVARY GLANDS: B. P. TRIBEDI & A. R. ROY. (O. A.) PAGE 367



Fig. 4.—Case 2. Low power view of the tumour showing lymphoid stroma and glands.



Fig. 6.—Case 3. High power view of the tumour showing lymphoid stroma and dilated glands containing cheesy material.

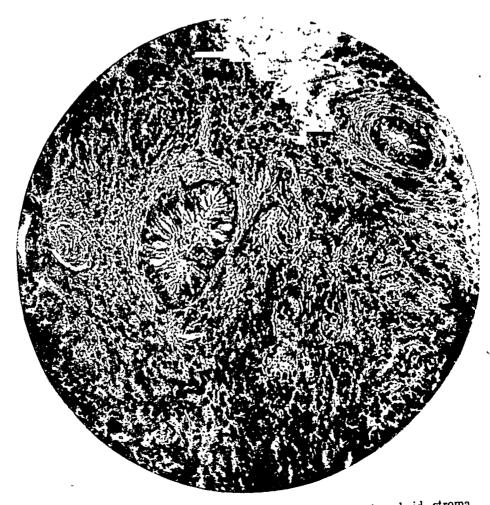


Fig. 5.—High power view of figure 4 showing the lymphoid stroma continuous dilutation of the glands was not found in this case.

and bismuth in increasing doses. After 4 gm. of bismuth had been given he developed deafness. Sulfarsenol was given once a week starting from 6 ctgms. With 24 ctgms. he showed intolerance and developed cervical lymphadenitis. He was then given 6 injections of sodi thiosulphate. The patient was absolutely free from pain and could sleep and eat well. The aneurysm tumour considerably subsided and his general health remarkably improved. As he was very reluctant to stay in the hospital he was discharged towards the end of September. He was re-admitted after about two months with extensive ædema of upper and lower limbs, ascites and purpura. aneurysm tumour had considerably increased in size and there was occasional bleeding from nose and ears and also petechial hæmorrhage in the skin and conjunctiva. The ædema of extremities was of a rather solid nature, the skin very much red and excoriated. The ædema subsided temporarily after about three weeks but re-appeared after a few days. The patient gradually went downhill and ultimately died of cardiac failure on 3rd March, 1948.

Summary.—Five cases of aneurysm of thoracic aorta have been described. The 5th case has been described in detail as it is a case of double aneurysm of the arch of the aorta which is extremely rare. The age incidence in all the cases is above 40, only one is female and W.R. is positive in 3 cases. The diagnosis is by no means easy and examination by radioscopy is most important in every case where aneurysm is suspected and may give valuable information. Classical signs of inequality of pulse and pupils, tracheal tugging, systolic murmur, ringing aortic 2nd sound, etc., may all be absent.

In conclusion, I wish to thank Dr. P. Chatterjee, the Superintendent of Medical College Hospitals, for his kind permission to report case no. 5 and my Senior H. P., Dr. S. K. Bose, M.B., for his assistance.

LYMPHADENOMA OF THE SALIVARY **GLANDS**

By B. P. TRIBEDI, M.B. (Cal.), D.B (Lond.), F.N.I. Professor of Pathology and Bacteriology, Medical College, Calcutta, and Bacteriologist to the Government of West Bengal

and

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NEOPLASTIC diseases of the salivary glands are by no means frequent and the features presented by the tumours of this origin show complications which require elucidation. But of all these tumours one of the rarest is what has been variously designated as papillary adenolymphoma, papillary cystadenoma lymphomatosum, papillary cystadenoma in lymph glands.

branchiogenic cyst-adeno-lymphoma, branchiogenic adenoma, epitheliolymphoid cyst, cylindrocellular branchiogenic adenoma, branchioma and onkocytoma (Carmichael et al., 1935). These authors further remarked that only within the last twenty-five years have these highly interesting tumours come to light, twenty-six eases being reported-eleven from Germany, six in France, four in America, two in Austria, two in Great Britain and one in Argentina.

Harris (1937) described two such cases as Adenocystoma lymphomatosis of the salivary glands, and reviewed the literatures and reported the total number of cases to be forty-

Since 1942, these tumours have been more frequently reported. McNeely (1946), in describing five such cases, reviewed the whole literature and reported the total number of cases, including his own five, to be one hundred and eight, the tumour was first described by Hildebrandt in 1895. Sirsat (1946) reported four cases in a group of fifty salivary gland tumours studied in the department of Laboratories, Tata Memorial Hospital, Bombay.

Considering the rarity and the interesting nature of the pathology of these tumours we are reporting three such cases that we have come across.

Case 1.—M., European, aged 60 years, with a mass just behind the angle of the mandible on the right side. He had no other complaint and he sought the operative aid for cosmetic purposes. The tumour originated insidiously about 8 years before his admission, and slowly continued to While removing the tumour it was found to be arising in connection with the parotid gland and it was well capsulated. The removed tumour was seen to be oval in shape 12 inches \times ½ inch \times 1½ inches in size, and lobulated in appearance (figure 1, plate XVIII). On cutting it open, cheesy purulent looking material was seen to come out. The patient made an uninterrupted recovery and was subsequently discharged. Histological examination of the tumour, which was sent with a provisional clinical diagnosis of tuberculosis, revealed the following:-

The tumour consisted of glandular element lying in a stroma of delicate reticulum infiltrated by many lymphocytes with the formation of well developed germinal centres (figure 2, plate XVIII). The glandular element consisted of tubular alveoli lined by a double layer of columnar cells. The surface cells which were taller had regularly arranged nuclei. The basal cells were smaller, irregular and lay close to the basement membrane (figure 3, plate XVIII). Some of the glands showed cystic dilatation, with papillary projections extending into the cystic spaces. No cilia could be seen in a series of sections from a number of blocks that were studied. Some contained structureless cheesy material in the dilated spaces, the columnar cells of which were seen to undergo atrophic changes. It was this cheesy material

which was possibly responsible for the macroscopic resemblance to tubercular caseation. In some of the areas the lymphoid element was. seen to be enclosed in a gland structure.

Case 2.—M., Indian, aged 48 years, with a tumour in connection with left sub-maxillary

gland.

Histologically the tumour presented an appearance similar to that of case 1, excepting that cystic dilatations of the glands and papillary projections into the cystic spaces were not evident (figures 4 and 5, plate XIX).

Case 3.—M., European, with a cystic swelling

over the angle of mandible right side.

The tumour originated insidiously about eight years back and, during operation, was found to be arising in connection with the parotid gland. It had a well-defined capsule.

Histologically (figure 6, plate XIX) the

picture resembled that of case 1.

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SEROLOGICAL TECHNIQUE (contd.)

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FURTHER DETAILS

Serum-protein content of complement dilution.—In the usual scheme of titration of complement the serum-protein content of the complement dilutions decreases steadily. It can be kept constant by making dilutions from an initial 1 in 10 dilution of an active complement with another 1 in 10 dilution of the same complement inactivated. The MHD (titre) is then found to be higher. This MHD may be used in critical work and for detecting weak reactions.

A similar effect is produced by adding serum proteins from the sera in the test proper. 2, 3 and 5 MHD of the complement added in the test, thus, yield more than the quantity indicated. Contrary to the common belief a normal serum, as a rule, is not anticomplementary but procomplementary. Further, the normal serum also protects the complement from the anticomplementary action of the antigen. The allowance of 1 MHD, made for some antigens, thus, leaves some complement free.

False and true variations in the LCF reaction of a subject at different times.—Reactions of the titrated positive controls vary when the necessary adjustments fail. When the adjustments are never made the reactions of certain sera in the tests proper are bound to vary too on repetition.

How much of the variation is real can only be determined by the behaviour of the titrated True variations have been reported. controls.

The incubator.—The self-regulating water baths do not prove satisfactory in localities like Calcutta where humidity is generally high and brass and copper surfaces turn green readily. An ordinary bacteriological incubator works better. As long as the tubes for the titration and the test proper are all incubated in the same way, it is immaterial whether water or air surrounds them.

The author puts up titrations in 3 inches \times ! inch test tubes in a metal rack and tests proper in wooden racks in 4 inches $\times \frac{1}{2}$ inch test tubes and incubates in an ordinary bacteriological The wooden racks hold one row of incubator. tubes. They are numbered and put together as many deep as required.

The water bath at 55 to 56°C.—This is necessary. Only one bath suffices and can be watched continuously (and regulated by pouring hot or cold water, if necessary). The bath described for the microtechnique will suffice if an electric or gas bath is not available.

Preserved complement.—Fresh complement, taken the same day, is to be preferred to the one preserved in a refrigerator overnight.

Ammonia in the laboratory.—Ammonia is known to damage the hæmolytic power of the complement. The vapour of ammonium sulphide is likely to be encountered in a high concentration in a room where blood stains are tested spectroscopically. It diffuses even into an adjoining room connected with a single communicating door. The author minimizes the concentration of the vapour (i) by keeping the number of preparations for spectroscopy minimal and (ii) by submerging the preparation in a 10 per cent solution of lead acetate after the spectroscopy.

Making of dilutions: 1. Complement dilution.—When several dilutions are required, as in the LCF, it is better to make first the strongest dilution and obtain the weaker dilutions from it, than to make all dilutions independently,

Let us suppose the MHD is 1 in 60.

- (1) A dilution containing 5 MHD in a volume (the standard volume used for the titration and the test) would be 5 in 60 = 1 in 12 = complement 1 part + saline 11 parts.
- (2) A dilution containing 4 MHD in a volume would be dilution (1) 4 parts made up to 5 parts with saline, by adding saline 1 part. What was contained in 4 parts of dilution (1) is now contained in 5 parts of dilution (2): that is to say, the strength of the second dilution is 4/5ths of the first. The MHD in the second dilution

per volume, therefore, would be $5 \times 4/5 = 4$.

(3) A dilution containing 3 MHD in a volume would be dilution (1) 3 parts made up to 5 parts with saline. The strength of the third dilution is 3/5ths of the first dilution. The MHD in the first dilution were 5. The MHD in the third dilution would be $5 \times 3/5 = 3$.

(4) A dilution containing 2 MHD in a volume would be dilution (1) 2 parts made up to 5 parts.

(5) A dilution containing 11 MHD (used in the reaction in gonorrhea) would be dilution (1)

1½ parts made to 5 parts.

The rule.—To convert a strong dilution into a weak dilution take a volume numerically equal to the desired strength and increase it to a volume numerically equal to the original strength.

2. Other dilutions expressed in percentage.— Further dilution of such dilutions follows the above rule also, thus:-

Example: Convert a 9 per cent solution into a 5 per cent solution. Take 5 c.c. of the 9 per cent solution and increase them to 9 c.c.

3. Solutions or dilutions expressed in parts.— The numerals in such solutions or dilutions are indicative of weakness, not of strength. The rule is reversed. Take volumes numerically equal to the original strength and increase them to volumes numerically equal to the desired strength.

Example: Convert a 1 in 12 dilution into a 1 in 15 dilution: Take 12 c.c. of the 1 in 12 dilution and increase them to 15 c.c. The quantity which was contained in 12 c.c. (and constituted 1 in 12 dilution) is now contained in 15 c.c. (and constitutes 1 in 15 dilution).

Measurements.—The accuracy is to be combined with speed. Stems of pipettes are marked for easy and quick observation with a glass making pencil. A scrutiny of the original graduation while delivering quantities and calculations on the stem for split c.c. are never permitted. As some liquids are opaque, the top of the meniscus is observed instead of the bottom in all measurements in the interest of uniformity.

The chemicals used must be weighed and measured as is done in chemical routines. remembering that large quantities and stock solutions are to be preferred to small quantities made up often.

Sterility in serological routines and special procedures.-Thé routines are timed. Maintenance of the bacteriological sterility though always kept in mind is not practicable. The surgical sterility is practicable and should be maintained. Nothing should be spilled and nothing touched. All glassware should be initially sterile. The pipettes should be kept on a stand or in the tubes containing dilutions to be used. The bottles for collecting animal blood should be tall so that splashing does not wet the necks. They should be plugged. rbe suspension should be in a large flask over the mouth of which is inverted a beaker. The flask is never to be corked and inverted for suspending or resuspending the rbc. This is

done by rotating the flask clockwise and then counter-clockwise.

For special procedures, such as injecting rabbits for the hæmolytic amboceptor, bacteriological sterility must be maintained. The rbc must be washed in rubber-capped centrifuge tubes. To this are to be added the extra care of clean hands and exclusion of currents of air, for an intraperitoneal injection.

POINTS IN PLANNING A COMPLEMENT-FIXATION REACTION

The antigen.—It is better to work with a dose which is not anticomplementary than to allow more complement for the anticomplementary titre of the antigen. Antigen No. 4 in the LCF reaction, as performed in the author's laboratory, is included for this reason. Antigen No. 1 could also be used in a smaller dose which would not be anticomplementary. To do so, however, re-establishment of the would involve а statistical data in the serology of syphilis. Besides, the reaction of the complement with this antigen serves a very useful purpose, indeed: it classifies the complement into (i) complement of optimal reaction, (ii) cholesterol-shy complement, and (iii) cholesterol-fast complement.

A dose of the antigen smaller than the one which is used as a routine should also be tried until it can be established that an excess is not responsible for paradoxical reaction at times.

The complement.—The author finds that the complement of optimal titre and reaction, as determined for the LCF reaction, gives the best results. Next come (i) high titre and optimal reaction, (ii) high titre alone, and (iii) optimal titre alone. He, therefore, recommends that all complement-fixation work should be linked to the LCF reaction for the purpose of obtaining the hæmolytic system.

Varying the dose of the complement and keeping the serum constant gives, on the whole, slightly more fixation but less differentiation. In strong reactions differentiation between + and T is more important than a slight increase in fixation.

If the anticomplementary titre of the antigen and the serum containing the antibody can be reduced to nil (or negligible), the dose of the complement for the reaction can be reduced to 1½ MHD and a complete inhibition of hæmolysis (with completely hæmolysed controls) can be obtained. Such a device is adopted in complement fixation in gonorrhœa.

The serum.—Antibodies formed as a result of immunization may disappear on inactivating the serum, at least in the early stages of immunization. Such is the case with anti-plague and anti-rabies bovine serum. The inactivation, then, must be done by aging the serum. Sheep serum containing the same antibodies is thermostable.

Varying the dose of the serum and keeping the complement constant gives, on the whole,

slightly less fixation but better differentiation. Further, errors due to paradoxical reactions are eliminated. In all complement-fixation tests other than the LCF reaction the author now varies the dose of the serum.

Incidentally, preserving of sera sent for complement-fixation tests to laboratories by post is recommended. Trikresol 0.35 per cent suffices. It is dissolved in 18 parts of ether and a drop of the solution added to 1 c.c. of the serum. For most purposes carbolic acid and water will do equally well. The antiseptic is almost eliminated by dilution. It does not decrease the reaction of fixation even when not eliminated.

Effect of cold.—Leaving the antigen-complement system with the antibody in the cold (ice box temperature, 2 to 8°C.) aids in fixation definitely. It is possible to obtain by this means a full fixation between reagents one of which would cease to exist at room temperature or blood heat, such as Rh positive human rbc + anti Rh animal serum + complement.
In the prolonged action of the cold, however,

there is one drawback: the loss of complement consequent on keeping cannot be estimated beforehand. The potency of the complement decreases on keeping and the decrease is not constant, even with the various known kinds of

the complement.

Even during a short exposure to the cold, an hour or so, a complication arises: the cold increases the fixation as well as the anticomplementary effect of the serum. The latter can be minimized by a previous exposure to room temperature and blood heat.

Significance of a + reaction varies.—In nonspecific reactions, such as LCF and reactions of sera from cases of kala-azar and leprosy with WKK antigen, a ± reaction, unless supported by history, is not significant. In specific reactions, on the other hand, such as complement fixation for gonorrhœa and hydatid disease, a ± reaction is significant.

THREE CASES OF ISO-IMMUNIZATION AGAINST Rh ANTIGEN FOUND IN FIVE WEEKS IN CALCUTTA AND ASSOCIATED CONSIDERATIONS

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Case No. 1

Mrs. K. R., Indian, agedu28 years, was sent for serological examination to this department, along with her husband, by Dr. L. T.

Complaint.-Repeated abortions, not due to uterine defects.

History.—

```
Pregnancies ...
                    Nine.
1st child
2nd ...
                    8 years old, and alive and well.
Died at one day old, full-term.
               ..
3rd
                     7 months premature, stillborn.
               . .
       "
4th
                                 miscarriage.
       37
                ٠.
5th
                    8
                                 stillborn.
       31
                           27
6th
                    6
      "
                           ,.
7th
                     7
      ,,
               ٠.
                           ٠,
8th
9th pregnancy
                    Present, 3 months.
```

General condition.—Good. A well-nourished young woman with a healthy look.

Serological tests.—(1) W.R.: negative in both husband and wife.

(2) Blood groups: Husband '0'; wife '0'.(3) Rh grouping: Husband:

(i) rbe with animal testing serum (rabbit), Rh + .

(ii) rbc with human testing sera (Wiener's):

Anti Rh' Anti Rh" (now anti-rh") Anti Rho (now antirh')

Result: The husband is Rh +, type Rh₁.

(4) Rh grouping: Wife:

(i) rbc with animal testing serum (rabbit), Rh -.

(ii) rbc with human testing sera (Wiener's):

Anti Rh' Anti Rh" (now anti-rh") Anti Rho (now antirh')

Result: The wife is Rh negative, type rh. (iii) Serum tested at first visit (i.e. 3rd month of pregnancy) with husband's cell suspended in saline = no agglutination.

Result: No iso-immunization.

*RBC agglutinated in clumps which have remained where they formed or have moved to the centre on rotating the slide (agglutination centripetal) RBC agglutinated in clumps which have moved to the periphery of the preparation (agglutination centrifugal) Intermediate Granularity only
Suspension as it was
++ clumps sometimes become large
plaques and move centrally. They are ++ best recorded as .. (Greval and Roy Chowdhury, 1946.)

The test was done in tubes also. Results on slides are given as they supply more information comparison.

(iv) Serum tested after another month (i.e. 4th month of pregnancy) with:

(a) Husband's rbc (b) Husband's rbc (group O) suspended in suspended in his own serum saline (conglutination)

++ (begins in + (begins in 10 minutes) 1 hour)

Result: The wife, Mrs. K., is Rh-, type rh and is iso-immunized against husband's Rh

group.

The serum obtained from the patient agglutinates.human rbc well in a 1 in 5 dilution both on slides and in tubes. It can be used as a testing serum for detecting ORh, ORh, ORh' collectively. This is the first human serum of good potency obtained in this laboratory.

(5) Rh grouping: Wife:

(i) rbc with animal testing serum, Rh-

(ii) rbc with human testing sera (Wiener's):

Anti Rh' Anti Rh" Anti Rho (now anti-(now antirh") rh')

Result: Rh negative, type rh.

(iii) Serum tested with unselected compatible rbc (Gr. O) suspended in saline from 4 subjects:

Nos. 1 (Gr. O) 2 (Gr. O) 3 (Gr. O) 4 (Gr. O)

(iv) Serum tested with unselected compatible rbc (Gr. O and B) suspended in their own sera from 8 subjects (conglutination):

Nos. 1 (Gr. O) 2 (Gr. O) 3 (Gr. O) 4 (Gr. O) 5 (Gr. B) 6 (Gr. B) 7 (Gr. B) 8 (Gr. B)

4,

Arrangements have been made to discuss with the doctor the plan of further tests. Information on immunological treatment has been given.

Patient's general condition is not good. Weak-

ness, vomiting, etc., are present.

The fact that the titre of the iso-immunized body rose from nil in the 3rd month to 1 in 5 in the 4th is worth recording.

The rbc from this patient were used in stand-

ardizing an animal serum.

Case No. 2

This case was detected in the course of standardization of animal serum using rbc from whole blood received for W.R. in the laboratory. The rbc found negative by animal testing serum were tested with human testing sera (Wiener's), anti Rho, anti Rh' and anti Rh" (vide infra), also.

The rbc were traced to a female patient in the Eden Hospital, Calcutta.

Patient.—Mrs. C., Anglo-Indian, aged 27 years, married 1 year.

Complaint.—Admitted into the hospital for first delivery. The child, full-term, healthy, died of Asphyxia Pallida within 1 hour of birth.

History.—No history of transfusion of blood nor of abortion.

General condition.—Below average, anæmic.

Serological tests.—(1) W.R.: Doubtful.

(2) Blood groups: Husband not available; wife (i.e. the patient), group 'B'.

(3) Rh grouping: Husband not available.

(4) Rh grouping: Baby. Blood sent for

serological test was hæmolysed and so Rh group could not be determined,

1, 2, 3, 4 of the second series are the same as the numbers of the first series.

RBC from subject no. 4 gave the reaction of Rh' with Wiener's testing sera. They are traced to a female patient in the Dufferin Hospital, Calcutta, who is case No. 3 in the chain.

Result: Mrs. C., Rh—, type rh, is also isoimmunized and the serum contains an anti Rh body including a blocking body other than anti Rh'. In the absence of any proof of abortion and blood transfusion the patient must have been sensitized by the first pregnancy. This fact is worth recording.

Case No. 3

The case was detected in the detailed testing of antiserum from case 2 when its rbc were not agglutinated.

Patient.—Mrs. A. R., aged 22 years.

Complaint.—2nd para, 7 months, was attending antenatal clinic.

History.—1st baby 3 years ago—Hydrops Fætalis. No history of abortion or blood transfusion.

General condition .- Not very well nourished. Below average, anæmic, Hb 45 per cent.

Serological tests.—

(1) W.R.: Weakly positive.
(2) Blood groups: Husband not available; wife (i.e. the patient), group 'O'.

(3) Rh grouping: Husband not available.
(4) Rh grouping: Wife (i.e. the patient):

(i) Rbc with animal testing serum, Rh-. (\ddot{u}) Rbc with human testing sera (Wiener's):

Anti Rh' Anti Rh" Anti Rho (now anti-(now anti-TP rh') rh"),,

+

(iii) Serum tested with unselected compatible rbc (gr. O) suspended in saline from 18 subjects:

rh'). These types and the types Rh" (now rh") and Rh'Rh" (now rh'rh") can be detected by the animal testing serum collectively as Rh—.

Nos. 1 (Gr. O) 2 (Gr. O) 3 (Gr. O) 4 (Gr. O) 5 (Gr. O) 6 (Gr. O) 17 (Gr. O)

+ + - ± - + ...

(iv) Serum tested with unselected compatible rbc (gr. O) suspended in their own sera from 7 subjects (conglutination):

This serum, therefore, should be used routinely by all blood transfusion services and blood banks, if human testing serum is not available.

Nos. 1 (Gr. O) 2 (Gr. O) 3 (Gr. O) 4 (Gr. O) 5 (Gr. O) 6 (Gr. O) 17 (Gr. O)

all to as the second

Numbers in the series (iii) and (iv) are the same.

Result: Mrs. A., Rh—, type Rh' and is isoimmunized. Her serum contains an anti Rh body of both agglutinating and blocking type.

The cause of Hydrops Fætalis of the first pregnancy has not been determined. Rh incompatibility, if operative, acted in the first pregnancy and is worth recording.

Associated Considerations

In the work on Rh reported from this laboratory since 1943 have been included: (1) Two presumptive cases of Erythroblastosis Fætalis (Greval, Roy Chowdhury and Banerji, 1946, 1947). They were in fact cases of the diseases: the adjective was used because the babies' blood had not become available for examination for the diagnosis of the disease in them. The mothers were proved to be Rh negative and isoimmunized against Rh positive blood. They were the first two cases reported in India. (2) A case of an Rh negative expectant mother with a hæmagglutinin other than anti Rh agglutinin in her blood (Greval, Roy Chowdhury and Banerji, Jour. I.M.A., 1946). Such cases are known and one should be on one's guard in including them in Rh iso-immunization. Another case was investigated last year but was not reported.

Other workers in India have also reported cases of Erythroblastosis Fœtalis (Ranganathan, 1947a, 1947b; Sanghvi and Khanolkar, 1947).

Yet in 1943, 1944 and 1945, in spite of circularizing the hospitals in Calcutta, the writers (S. D. S. G. and A. B. R. C.) failed to discover a single case. The clinical recognition of the condition appears to have been unduly delayed. In the present chain of 3 cases 1 was contributed by a clinician and 2 by the laboratory. As the clinician develops more interest in Rh the number of cases is bound to increase.

Out of the 3 Rh negative cases of isoimmunization reported in this communication, 2 belonged to type rh and 1 to type Rh' (now Iso-immunization among the various Rh negative types is possible and cases have been reported. A subject Rh' (now rh') may be iso-immunized against Rh" (now rh") and vice versa. The typical case, however, is always iso-immunized against the Rho antigens, namely, those found in the rbc of subjects Rho, Rh₁, Rh₂ and Rh₁Rh₂. According to the latest classification only these subjects are Rh positive, while subjects rh, Rh' (now rh'), Rh" (now rh") and Rh'Rh" (now rh'rh") are Rh negative.

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ERRATUM

A SIMPLE METHOD OF CUTTING SERIAL SECTIONS OF TICKS

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(Indian Med. Gaz., 83, April 1948, p. 181)

In the second line of the footnote under column 2, for 'HgC12' read 'HgCl2'.

A Mirror of Hospital Practice

A CASE OF BACTERÆMIA CAUSED BY BACTERIUM ALKALIGENES FAECALIS

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Petruschky isolated Bact. alkaligenes fæcalis from human stool in the year 1896. Since then many workers like Petruschky (1896), Hirst (1917), Khaled (1923) and others published reports of bacteræmia caused by this organism having clinical manifestation of enteric-like fever. Reports of such cases have seldom been published in India.* The case described below, however, resembled more a case of bacteræmia due to Bacterium coli terminating fatally than one of enteric type as described by Petruschky and others.

Case record.—Mrs. Singh, aged 25 years, was admitted to Railway Hospital at Allahabad on 5th March, 1948, with complaints of intermittent fever for 7 days and griping pain in the abdomen with loose motions for 3 months.

History.—She suffered from frequent attacks of diarrhea during the previous six months. There were five abortions within the last 11 years of her married life.

Examination.—The patient looked pale, emaciated and anæmic. Her tongue was clean and moist and the appetite was good. Besides slight tenderness in the lower abdomen, no other abnormality was detected in any other regions. The temperature was intermittent in type coming down to normal in the morning and rising to 101° to 103°F. in the evening (see chart). The pulse rate varied between 98 and 118 per minute. She was treated on general lines but there was no improvement and she died on 21st March, 1948, i.e. 14 days after admission.

Laboratory findings.—

Hb.—9.8 gm. per 100 c.c.

Total R.B.C.—3,520,000 per c.mm., most of the cells were microcytic and hypochromic.

Total W.B.C.—5,800 per c.mm.: Polymorphs—65 per cent, lymphocytes—22 per cent, monocytes—6 per cent, eosinophils—7 per cent.

Malarial parasites—not seen.

Aldehyde test and Chopra's test-negative.

Kahn test—negative.

E.S.R.—27 mm. in 1st hour.

Widal positive against TH—1 in 25 but negative against AH, BH, CH and Brucella melitensis.

Blood culture—Bact. alkaligenes fæcalis grown.

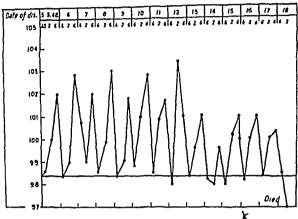
Stool—No abnormality detected on repeated examinations.

Sputum—Repeatedly negative for A.F.B.

Urine—Reaction acid, albumen nil, sugar nil, microscopic examination showed plenty of calcium oxalates and a few r.b.c.

Culture sterile.

X-ray—No abnormality was detected in either lung field.



Comments.—A case of anæmia, emaciation and hectic intermittent type of fever with diarrhea is apt to lead to a clinical diagnosis of B. coli infection or abdominal tuberculosis or as this case was provisionally diagnosed by some physicians as a case of (?) macrocytic anæmia as seen in sprue. The clinical picture also resembled typhoid fever and bacterial endo-carditis. The urine was sterile on culture, blood picture showed a hypochromic-microcytic type of anæmia, stool did not show any abnormality in ordinary microscopic examination, Widal reaction was positive against Bact. typhosum 1 in 25 and no abnormality was detected in the heart. A tuberculin test could not be done, the abdominal glands were not palpable and there was no ascites. The blood culture revealed the true nature of infection. Petruschky, Hirst and others reported on a typhoid-like infection due to bacteræmia with Bact. alkaligenes fæcalis but this case showed a temperature chart as seen in B. coli infection, with Widal reaction positive in 1 in 25 against Bact. typhosum. In all probability this was originally a case of chronic bacillary dysentery insufficiently treated which led to some chronic ulceration in the bowels from where the infection with Bact. alkaligenes fæcalis, a non-pathogenic inhabitant of the intestine, was introduced into the circulation. We would like to emphasize the importance of blood culture in all undiagnosed cases of pyrexia which unfortunately is not yet very popular in general practice.

^{*}See Ahad, N. (1942), Indian Med. Gaz., 77, 530, and Chaudhuri, R. N. (1944), Ibid., 79, 169.—Editor, I.M.G.

We wish to thank Dr. S. S. Kent, Chief Medical Officer, E. I. Rly., Calcutta, for kindly permitting us to report this case and Dr. J. R. Bhatia, Divisional Medical Officer, E. I. Rly., Allahabad, for his encouragement. We are also grateful to Drs. A. B. Mukherjee and G. B. Biswas, E. I. Rly. Hospital, Allahabad, for their help.

CASES OF SPRUE TREATED BY LAPAROTOMY

By Captain A. HAMID, M.R.C.S., L.R.C.P., D.C.H. (Eng.) Superintendent, Dispensaries, Mandsaur (Gwalior State)

THE idea of doing laparotomy in these sprue cases was to see the effect of a localized peritonitis acting as a counter-irritation. So far a few cases have been treated. All these cases were operated on clinical diagnosis and findings. As the cases were typical, no stool or blood examination was done These cases were not improving on the orthodox treatment of diet, vitamins, The effect was iron, and liver injections. dramatic. The loose motions stopped suddenly. The patients did not have any motions for three to four days without any discomfort. The bowels were moved by a small enema for the first time, then afterwards there were semi-formed stools once a day or every other day, naturally. There did not develop any tympanitis as a result operation or constipation. The general condition of the patients began to improve soon afterwards and they gained weight rapidly. Other conditions such as stomatitis, glossitis, abdominal discomfort and anæmias associated with sprue were also improved by subsequent treatment and nourishment. The patients were kept on the same sprue diet as they had before the operation for two to three weeks, and then they were put on milk, sago, rice, lentils, and vegetable soup afterwards. Vitamin B complex, plastules and liver extract injections were continued for sometime.

The laparotomy was done by lower median incision, the abdomen was opened, intestines were gently massaged and a drachm of ether was poured in before closing the abdomen. General anæsthetic was used in all these cases.

Case Reports

1. A woman, aged 23 years, nullipara, admitted on 14th March, 1947, duration of illness 7 months. She had been to Badrinarayan pilgrimage, since then she had this trouble. This was a case of typical sprue, well advanced and emaciated, having three to four motions a day. She had dietetic and medicinal treatment before. She was operated on 21st March, 1947. After that she had no motions for three days. The howels were moved by small enema, after that she used to have one well-formed motion every other day for a few days, then once a day afterwards. She was put on the same preoperative diet with vitamins and liver injections.

She had one blood transfusion after the operation. The diet was changed after one week: milk, sago, rice, vegetable soup were given. She put on weight rapidly and her general condition improved enormously. She was discharged on 23rd April, 1947, having ordinary diet without spices.

2. A man, 30 years of age, married, admitted on 18th August, 1947. Duration of illness was 6 months. The illness started with the onset of fever and diarrhea. He had some treatment from vaidyas, hakims, and allopaths too but with no effect. He was already on strict diet before admission and being a typical case of sprue resisting medical treatment I took him for operation after 2 days. The operation had the same effect on him, bowels were moved on the 5th day by a small enema. He used to have well-formed motion every other day for a few days, afterwards one motion a day. He was kept on the same treatment and diet as before. He put on weight so rapidly that he thought he had ædema of face and abdomen.

3. A man, 40 years of age, admitted on 11th September, 1947. Duration of illness one year. He had been to Badrinarayan: after that his illness started. He was very anæmic with puffy face and ædema of feet. Glossitis, stomatitis and emaciation were also present. No albumin and sugar were found in the urine. He used to have six motions a day. Laparotomy was done on 18th September, 1947. There was no motion for five days without any discomfort, bowels were moved by small enema and then he used to have natural motion every day. He was given same diet and treatment as the other patients had before. He was discharged from the hospital after six weeks, in quite a good health.

4. A woman, aged 25 years, married, admitted to the hospital on 1st May, 1947. Duration of illness five months. She had loose motions with stomatitis and glossitis, and severe anæmia. She used to have 8 motions a day before admission to the hospital. She was put on diet and other treatment for a few days with no improvement. She was operated on 5th June, 1947. She did not pass any motion for three days but had a motion naturally on the fourth day. Afterwards she used to have one motion every other day for a week, and then one well-formed motion a day. She was put on the same line of treatment as before. She gained in weight and her general condition was much improved before she left the hospital.

Conclusion

The patients who were not improving on the strict diet and medicinal treatment, improved suddenly after laparotomy. Sudden stoppage of persistent diarrhea and afterwards one motion a day was characteristic. No relapse in these cases so far have been reported. The treatment is less expensive and more effective in advanced cases.

I am thankful to Dr. G. L. Sharma, R. M.O., of Civil Hospital, Mandsaur, for his help in keeping the record of the cases and their treatment.

[Further observations, specially without the standard medical treatment, are called for.—EDITOR, I.M.G.I

A CASE OF PLASTIC BRONCHITIS

By MAJOR KHUSHDEVA SINGH, M.B., B.S., T.D.D. Medical Superintendent, Harding Hospital, Dharampore

thirty-four S., aged about came to me on the 21st March, 1948, and complained of cough and malaise. His temperature was normal, pulse was 80 per minute, and tongue was moist and clean. The physical examination of the chest did not reveal any abnormal findings on percussion or auscultation. He was prescribed a saline expectorant mixture for his cough.

On the 25th March when he again came to the hospital, he was slightly dyspnœic, and looked ill. He had a very distressing unproductive cough, which had a peculiar tone, resembling whooping cough. His temperature was 101°F., pulse was 116 per minute, and tongue was

slightly coated and moist.

On physical examination of the chest, vocal fremitus was found diminished at places, percussion note was normal over greater part of both the lungs, and musical cooing rhonchi were heard on both the sides during inspiration as well as expiration. I put him on expectorant mixture containing bromides and belladonna, and steam inhalations medicated with tincture benzoin co.

The patient apparently did fairly well on this treatment for four days. On the fifth day, that is on 29th March, his temperature suddenly rose to 104°F. I went to see him and found him in great distress. His face looked cyanosed and he had severe dyspnæa. The alæ nasi and the accessory respiratory muscles were in violent action. Cough was severe, expectoration was slight and was ropy and mucoid in character. The patient had cold sweat on his forehead in spite of high temperature. His pulse was 140 per minute, tongue was dry and coated and a peculiar smell was coming from his mouth.

On physical examination of the chest, cooing rhonchi were heard over greater part of both the lungs, and at some places the breath sounds were feeble. I put the patient on M.&B. 693 tablets, ephedrine tablets, and tincture benzoin

compound inhalations.

As the patient could not tolerate the drug it was discontinued after he had taken only three

His sputum was examined on 30th March. It was ropy and mucoid in character, and was slightly blood stained. On microscopical microscopical examination it showed the presence of a large number of streptococci in every field, and elastic tiseue

I put the patient on penicillin injections, 25,000 units every four hours. Next day his temperature came down to 100°F., and giddiness and retching disappeared. The cough was slightly less but the dyspnæa was as severe as before. Penicillin was administered for four days when the patient looked slightly better and his temperature came down to 99°F. Cough was less and there was no whooping. Dyspnœa was troublesome and there was slight cyanosis of the face.

I put the patient on potassium iodide mixture, and steam inhalations medicated with tincture benzoin compound. I also advised the patient

to be x-rayed.

On the night of 6th April the patient had a very severe cough, and in one of these bouts of cough brought out a few tube-like structures which were preserved by the patient and shown to me next morning. I found them to be bronchial casts. These were five in number, one to two inches long. Three were hollow while the other two were solid. These looked greyish white in colour, and later on turned brownish.

The skiagram, which was taken on 7th April, showed signs of bronchitis and peribronchitis, and the diagnosis of plastic bronchitis was made. I sent the skiagram to Doctor Dozent George Politzer, M.D., M.R., for expert opinion, and he very kindly sent the following

'Your diagnosis is correct, at least I am not using the expression plastic bronchitis. I write, instead, bronchitis, peribronchitis, the latter with signs towards fibrous transformation. Both mean the same '.

The next day the patient again coughed up a large number of casts, which were from one to one and a half inches in length, and varied in diameter from that of a capillary tube to a macaroni stick. The casts looked greyish in

The sputum and casts were preserved in separate sterilized phials, and were sent to the Central Research Institute, Kasauli, for the microscopical and cultural examination of the sputum, and the histological examination of the casts. The report that was received from that institute reads as follows:-

The following is the result of examination of a specimen of sputum, and bronchial casts of Mr. R. Singh, with your letter dated 9th April :-

Microscopical examination.—Mainly pus cells and elastic tissue; streptococci and staphylococci present. Acid-fast bacilli not seen.

Cultural examination.—Streptococci hamo-

lyticus and non-hæmolyticus isolated.

Histological examination.—Specimen sent for histological examination shows elastic and hyaline tissues infiltrated with inflammatory cells, chiefly polymorphs, small round cells and a few eosinophils.

The patient was feeling better, his cough was less, but he continued to cough up casts for about twenty days, the number of easts varying from two to seven daily. The dyspnæa also disappeared, but his temperature did not come down to normal, being 99° to 99.2°F. in the evening. He had also a sense of heaviness in his head, a peculiar smell in his mouth, and a tired feeling in the evening.

The patient was sent to Amritsar for further investigation. There a skiagram of his skull was taken on 6th May, 1948, and it showed the infection of the frontal, right ethmoid, and the right maxillary sinus.

Maxillary sinus was punctured at V. J. Hospital, Amritsar, on 10th May, 1948, and it was found to contain 'Fibrinous cast in the meshes of which acute inflammatory cells were present and also pus'. The sinus was irrigated daily, and the patient was again put on penicillin. His temperature came down to normal in a few days with this treatment.

Now the patient is practically normal, but I have put him on multi-vitamin tablets, and *Streptococcus hæmolyticus* vaccine to give him some resistance against the infection.

The interesting points about this case are:-

- 1. The plastic bronchitis is a comparatively rare disease, and this patient showed all the typical signs and symptoms of it.
- 2. The attack lasted longer than an ordinary attack of acute bronchitis.
- 3. Association of the infection of the right maxillary sinus.
- 4. In the medical literature it is described that the cause of this disease is unknown. Could not Streptococcus hæmolyticus in certain type of patients be the cause of the formation of casts as in this case?

SEBACEOUS HORN PENIS

By BRIJ-MOHAN BHARADWAJ

Medical Officer, Padam Hospital, Jubbal (Himachal Pradesh)

Cases have been reported in medical literature of sebaceous horns growing out from various parts on the body such as the nose, the ear and the scalp, but I have not come across any mention of this condition occurring on the penis.

Padam Sing, 40, Hindu male labourer from Garhwal, was admitted to my hospital. He complained of inability to have coitus due to a 'horn' growing on his penis, which ordinarily caused him no pain except when the organ became erect, duration 3 years. This horn, he stated, started as a small hard nodule on the right side and immediately external to the urethral opening and kept on growing until it adopted a tubular pointed horn-like shape.

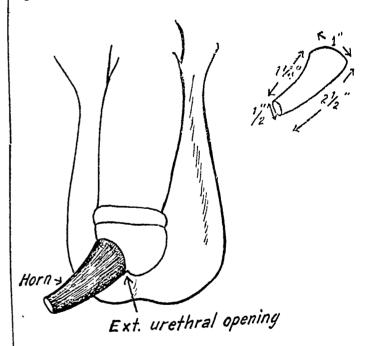
In one year's time it was about an inch long. He consulted a doctor who cut off the tip leaving a circular hard root intact. From this root the tumour kept on growing until it reached the size shown in the diagram.

All along he had no difficulty in micturition except for the fact that the stream of urine became narrower.

On examination I found the mass arising from the glans on the right side of the external urinary meatus and immediately adjacent to it. It was a hard dark brownish cartilaginous hollow body I inch in diameter at the base and $\frac{1}{2}$ inch at the tip; outer curvature of the horn measured $2\frac{1}{2}$ inches and the inner curvature $1\frac{1}{4}$ inches. It resembled a horn very much indeed.

After proper pre-medication the patient was operated under general anæsthesia and the tumour was removed from its root on 1st May, 1948. The patient made an uneventful recovery and was discharged from the hospital on the 13th May, 1948, with the wound quite healed.

I have since heard from the patient who is quiet well and leading a happy married life.



Therapeutic Notes

NOTES ON SOME REMEDIES XXII.—BLOOD TRANSFUSION, Part I

By R. N. CHAUDHURI, M.B., M.R.C.P., T.D.D.

Professor of Tropical Medicine, School of Tropical

Medicine, Calcutta

Bloop transfusion has become a relatively safe and simple procedure owing - to our

knowledge of human blood groups and the use of sodium citrate as an anticoagulant. There are four main blood groups, depending on the presence or absence of two agglutinogens A and B in the red cells. These cells may carry one (A), the other (B), both (AB) or neither (O) of the two agglutinogens, thus making four groups which are named after their cell agglutinogens. (A and AB are each divided into two sub-groups A, and A, A, B and A,B.) The corresponding agglutinins (or anti-A) and (or anti-B) occur in the serum, and if these come in contact with the homologous agglutinogens contained in the red cells, the latter will be agglutinated. any individual cannot cor The blood of both contain agglutinogen and the corresponding agglutinin, otherwise auto-agglutination would occur. The position is shown in table I. It should be noted that group O cells contain no agglutinogen, hence cannot be affected by sera of any of the groups; persons belonging to this group are therefore universal donors. On the other hand those of group AB having no agglutinins are known as universal recipients.

TABLE I
Showing agglutinogen—agglutinin contents
of blood groups

Group	Agglutinogens (corpuscles)	Agglutinins (serum)	
AB A B O	AB A B O (none)	o (none) β (anti-B) α (anti-A) α + β (anti-A and anti-B).	

The phenomenon of hæmagglutination is of vital importance in blood transfusion. The first essential is to find out whether the donor's blood is compatible with the recipient's blood, the most important condition being that his cells must not be agglutinated in the latter's circulation. With rare exceptions the agglutinins in his serum are so diluted in the recipient's blood as to have no appreciable effect on his cells. The ideal donor for any particular case is an individual of the same group. When this is not possible, one will have to rely on group O, and indeed this group, being universal donor, is used for building blood banks. From table II it will be seen that group A can take blood from A or O, B from B or O, O from O only, and AB can take blood from donor of any group.

Human erythrocytes contain, in addition to A and B, other agglutinogens of which the rhesus or Rh factor is the most important. Its importance will be discussed later.

The safety of blood transfusion depends on properly performed blood tests; these are best carried out by trained personnel. The usual

TABLE II
Showing reactions between donor's cells and recipient's serum

Donors' cells	Recipient's serum				
Agglutinogens	Agglutinins				
-	(AB)	β (A)	(B)	α + β (O)	
AB A B O	- - - -	+ + + -	+ + - -	++++	

+=agglutination.

-= no agglutination.

Letters in brackets indicate corresponding groups.

procedure" is (1) to group the donor and the recipient, both cells and sera being tested and (2) to do a direct test of cross-matching their cells and sera. In an emergency as in traumatic shock where expert aid is not available, it is permissible to give transfusion after directly testing the recipient's serum against the donor's cells—a procedure which can be easily learnt by any practitioner. The Rh factor requires special test for its detection. Blood should always be specially tested in multiple transfusions and in transfusing women during pregnancy and puerperium and new-born infants.

Indications

Transfusion of blood, plasma or serum is used mainly to restore blood volume in hæmorrhage and burns in which it is a specific form of treatment. In certain conditions it acts as a supporting measure, contributing the deficient or missing elements in the blood, e.g. corpuscles in anæmia, or platelets in essential thrombocytopenia. It is very useful before operations on anæmic patients. Small repeated transfusions are of value in septicæmia possibly because of transferred antibodies, complement or other factors. In coal gas poisoning a large percentage of hæmoglobin may be immobilized when venesection followed by a large transfusion acts as an effective remedy. Plasma and serum, besides being used as blood substitutes, have been employed in protein deficiency associated with some chronic conditions.

Transfusion materials (1) Whole blood

Citrated blood is now practically universally employed. The ideal is to use freshly drawn

^{*}For details of blood testing, see M.R.C. War Memo., 9, 1943. H. M. Stationery Office. 4d.

blood, but the last war has demonstrated that such blood can be stored in a citrate-glucose mixture at 2 to 6°C. and used without undue reaction until about 2 to 3 weeks after collection. This blood is almost as efficacious as fresh blood at least in the treatment of acute hæmorrhage. The stored blood must not be allowed to freeze or severe reactions may ensure. The leucocytes of stored blood rapidly die and the platelets are lost by adhering to the sides of the container. Fresh blood should therefore be used for transfusing cases with a poor white cell count (e.g. agranulocytosis) and those suffering from acute sepsis, hæmolytic anæmias or purpura. Before transfusion, the stored blood should be allowed to come to room temperature by standing or by slow warming, but it should not be heated in any way lest hæmolysis occur.

(2) Plasma

When citrated blood is stored, the cells settle into a compact layer surmounted by clear plasma which can be easily pipetted off and used in transfusion. The protein content of this plasma is about 4.5 per cent, a little less than that of serum owing to the added diluent. Plasma is prepared from a pool of several samples of blood of all groups and has an insignificant agglutinin titre and so can be administered irrespective of the group of the patient. It deteriorates with storage but keeps well for about a year if kept in a cool dark place, no refrigeration is required. It should be filtered, but if there is any flaking or precipitate in the bottle it should be discarded.

Plasma can be dried in vacuo at low temperature. Dried plasma is a very stable product and can be stored indefinitely, and as it needs only sterile water (or saline solution) to dissolve it and being free from the risk of bacterial contamination, it allows transfusion to be carried out under adverse circumstances even in remote Owing to these reasons plasma has to a certain extent superseded the use of whole blood except in severe hæmorrhage. It is particularly indicated when there is hæmoconcentration as in burns and has also proved valuable in hypoproteinæmia as an agent to raise blood proteins. It is very suitable in emergency maternity work as it does not produce any of the rhesus-factor complications. Plasma does not contain any red or white cells, it has therefore no value in anæmia or agranulocytosis.

(3) Serum

Serum is prepared from non-citrated blood which has been allowed to clot and like plasma it can be stored wet or dry. Its protein content is about 7 per cent. It is probably as good as plasma.

To reconstitute, the dried product obtained from 400 c.c. of serum or plasma is mixed with 400 c.c. of sterile distilled water by gently

shaking the bottle and warming it to 37°C. The solution appears turbid and is filtered before use. It should be used without delay.

(4) Red cell suspension

When the bulk of plasma is drawn off from stored blood, a mass is left consisting of red cells, plasma and citrate solution. This mass is normally wasted but can be transfused in anæmia to make up for the deficient erythrocytes. Red cell suspension is prepared by pooling contents of several bottles containing the rbc of the same group and filtering through a gas mantle. It furnishes about 18 gm. of hæmoglobin per 100 c.c. of the suspension and has been used in anæmia after hæmorrhage and in chronic anæmia with results which appear to be as good as after whole blood transfusion. One great advantage is that it raises the hæmoglobin value without overloading the circulation, which is a definite risk in the transfusion of anæmic patients. Administration should follow as soon as possible after separation of the plasma. Cross-matching of donor's and recipient's blood is necessary. The transfusion is given by the usual gravity method but the flow of the suspension is apt to be irregular owing to its high viscosity; a pump is useful.

Dosage

Each case is treated on its merits and no rule as to dosage can be given. The object in a shocked patient is to raise the blood pressure to 100 to 110 mm. of Hg. and maintain it at this level and in anæmia to raise hæmoglobin to the required degree.

Method of administration*

The fluid is introduced through an intravenous needle; occasionally a canula is needed. A vein in the anticubital fossa is usually chosen, but when a long transfusion by drip method has to be given, a vein in the forearm or wrist is more convenient from patient's point of view. It is helpful to splint the limb or put it between sandbags. If necessary, the internal saphenous vein can be used. Occasionally in shock, the vein gets into a state of spasm when it is difficult to transfuse enough fluid. In such a case the external jugular vein is the route of choice. If for any reason no suitable veins are available, fluid may have to be administered into the marrow cavity. Sternum is a convenient site, but great care is necessary. In infants the tibia or the sagittal The rate of flow sinus is to be preferred. depends on the patient's condition. In severe cases transfusion must be rapid at first to make up for the blood loss, but in anæmia it is given at a very slow rate, or there may be cardiac failure.

^{*}For details of transfusion technique textbooks should be consulted.

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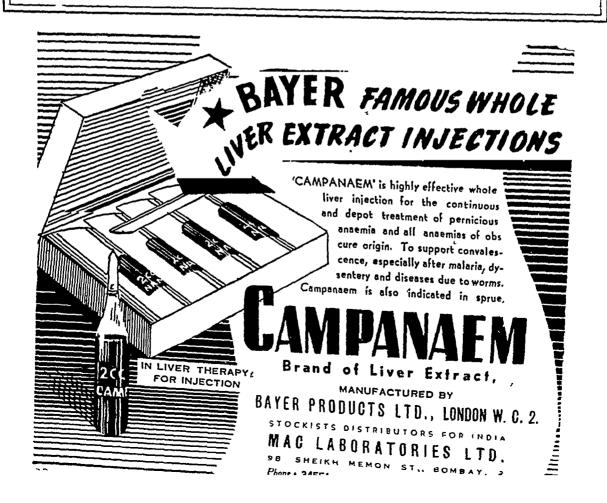


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Indian Medical Gazette

AUGUST

HOMICIDE AND CAPITAL PUNISHMENT

KILLING of a human being is homicide. It is not synonymous with murder. It may be murder if the motive and intention exist; culpable homicide not amounting to murder if the motive and intention do not exist; still 'culpable homicide not amounting to murder when the person whose death is caused, being above the age of eighteen years, suffers death, or takes the risk of death, with his own consent (The Indian Penal Code, section 300, exception 5); justifiable homicide if undertaken in private defence of one's own person or even that of another; or no crime at all if the act leading to it is done by an insane person. Infanticide. is still murder in India. In England it was made into a special crime, far removed from murder, in 1938 (Smith, 1943; Glaister, 1942; Simpson, 1947).

Punishment for murder is engaging the attention of legislators in England at present. A few weeks ago the House of Commons passed a bill abolishing the death penalty for murder. This bill was thrown out in the House of Lords. While the bill was in its passage the number of murders in the country actually increased. The bill was then amended in the House of Commons and a compromise clause added.

The compromise consisted of recognizing two categories of murder—the capital and non-capital (Parliament, 1948). The capital category consisted of 5 classes: (1) murder committed (i) in robbery, burglary or house breaking (gangster offences), (ii) by three or more persons acting together, (iii) with explosive or destructive substances, or (iv) in connection with sexual offences. (2) Murder of a police officer or of a civilian assisting a police officer. (3) Murder by poison administered systematically. (4) Murder of a prison officer. (5) A second murder. All other murders fell within the non-capital category. This compromise clause was carried in the House of Commons by 307 votes to 209 on 15th July, 1948. The amended bill was also rejected by the Lords.

According to the Indian Penal Code the two categories have always been recognized in as much as the judge has had the option of awarding a capital and a non-capital punishment. The award depends on: (1) The age. An accused of tender years, even when not a minor, is not hanged. (2) Killing with special ferocity. A single fatal blow might not have been really intended to kill, but several fatal blows leave no

doubt as to the intention. In exercising the right of private defence (sections 96-106, Indian Penal Code) the same considerations will also hold to some extent. The purpose should be rather to incapitate than to kill the aggressor. On both (1) and (2) medical opinion may be helpful. It is indispensable if insanity is suspected in the accused or pleaded on his behalf.

Incidentally, the right of private defence has a wider scope in India than in England. Under it in England besides one's own person one can protect the person of one's relatives only: In India one can protect the person of anybody in danger. Both in England and India the right applies to the protection of property also. These are purely legal matters. The medical man, however, should know their extension and limitation in order to comprehend all that could have been done to the victim by the accused, in a case falling under this right.

Another legal matter is the exception 5 of section 300 of the Indian Penal Code. The age, the behaviour (in a psychiatric sense) of the accused or of the victim and any incurable disease in the victim, however, become medical matters.

On a previous occasion we have advocated in these columns the operation of the irresistible impulse (Editorial, 1947). From a medical point of view this impulse also needs a consideration before an irreversible punishment is awarded. The impulse is known to be stronger in the tropics than elsewhere.

'Thou shalt not kill' on the whole finds more and more acceptance every day with most of us. A war-weary world stopped cruel sport after the World War I. It may now or perhaps after the World War III purge out of justice the ingredients of revenge and terrorization: revenge upon the killer and terrorization of would-be killers.

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BETWEEN OURSELVES ON PREPARING A THEME

Do not try the readers' patience. The first and the most trying item in wading through the early part of many writers' papers is the summary of other writers' work. If given as found it may provide knowledge but not systematized knowledge: only the latter is science and we expect our contributors to provide our readers with science. If workers A to Z have tried the effect of Guligumba on Borealitis, one need not give 26 summaries. If the drug is worth wasting paper and ink on at least 10 therapeutists must be definitely in its favour, about 10 undecided and, let us say, about 6 against. Then these opinions can be summed up in three short sentences. The names and dates can be bracketed together thus:

It is claimed that mortality has been reduced from 95 per cent to 15 per cent (L'Allegro, 1950; Smiles, 1951; Hope, 1952 . . . until the category of those in favour has been exhausted). On the other hand no material object or benefit has been recognized (Il Penseroso, 1950; Grumpy, 1951; Killjoy, 1952 . . . until the category of those against has been exhausted). Careful workers do not appear to have made up their minds (Steady, 1950; Crawley, 1951; Unready, 1952.... until the category of those who do not rush in where angels fear to tread is exhausted). The reader is not interested in the names as much as in the result of the drug. Outstanding names he will pick up even from inside the With the others please do not bore brackets. him.

Of course if there are subtle differences between the members of the same group they must be stated and are best stated in a separate paragraph. There will not be more than one or two such differences on the continuance of Guligumba, for instance, after the temperature, pulse and respiration have become normal. L'Allegro and Smiles may have a difference of opinion. Hope of the same category may resolve the difference by the help of a detailed obfuscogram: when the VCM and CHCM of the obfuscogram are only plus or minus 10 of the normal the possibility of a relapse may be ruled out and the expensive drug discontinued with safety.

Perfectly original or really useful observations which follow these summaries are so often lost to the reader who refuses to wade through the piled-up cud chewed by others. He is not to blame. He is under no obligation to go through the entire composition like the editors. In fact, the pile of cud seems to be distasteful to the writers themselves to pass through more than once; otherwise there will not be so many grammatical errors in this part: articles when there should not be any and no articles when there must be one; utter lack of past perfect or simple past after the past perfect; sigular pro-

nouns after plural nouns; split infinitives; adjectives in place of adverbs and so on—faulty spelling we do not mind, we expect the secretary in this office and the printers' proof reader in the press to look after it.

The second trying item is the tyranny of mathematics. Let it be remembered well that in crystallizing findings for a clinical journal like the I.M.G. terse sentences in telegraphic English are to be preferred to tables, and the tables are to be preferred to graphs. We use telegraphic language on case sheets; it will be understood by all. The tables have their uses and are at times inescapable. Let them be short. The standard deviation should be strictly deviated from the narrative. Those desiring it will work it out themselves. If your conscience will not rest until it is given, give it as an addendum at the end of the paper. For things that really matter it is never required: such things are temperature, pulse, respiration, rbc count, wbc count, Hb. percentage and blood pressure. We have a shrewd suspicion that those who force the deviation on us for every numeral do not really understand the business. Whether they do or do not, we as clinicians and even as laboratory workers do not want their aid as long as we accept as helpful only results which hit us between the eyes; such results have been recently produced by sulpha drugs and antibiotics and nobody has felt the least need for a, κ , $\sqrt{}$ and ϕ ; simple +, -, \times and \div have delivered the goods. Advances in medicine have always occurred by leaps and bounds, not by slow evolution based on tedious calculations subject to α , κ , $\sqrt{\ }$ and ϕ . The epidemiologist seek aid from such calculation and yet the epidemics take their own course.

Tables are to be preferred to graphs because by altering the unit in the ordinate or the abscissa two graphs based on the same table can be made to look different. Besides, the percentage, the commonest of condensed wisdoms of numerals, is based on tables, not on graphs. When all is said and done graphs are comparable to the 'mark' and a table to the 'signature'.

The third trying item is the idiomatic and figurative language. A style embodying idioms and figures is not suitable for scientific description. In this respect the Indian Penal Code provides a model for expressing one's self in English, as medical men with medicolegal turn of mind realize.

Besides, an idiom is really only a slang that has not been suppressed, and minimizing and magnifying realities behind a cover of slang and figures of speech run counter to telling 'the truth, the whole truth and nothing but the truth' even in daily life outside the courts.

Further, simple English, making the nearest approach to the basic English, is the easiest to write and to understand.

Equivalents of provincial idioms, etc., if found irresistible, should be put in inverted commas:

so expressed they may even be useful in attract-

ing attention.

The fourth trying item is the faulty presentation of the theme. When a contributor has felt the urge to spend time in writing for a journal he certainly has a message to give. If the message is unacceptable there is an error in the presentation. The error can be rectified. contributions, roughly speaking, fall under (1) original articles, (ii) occasional notes, (iii) special articles, (iv) correspondence, and (v) any questions. Out of these, special articles and occasional notes are reserved for senior writers who have devoted years of study to the subject and who can speak with some authority. Younger writers should wait until they have attained that status. Perhaps what they want to say in a long article can be said more shortly and effectively under correspondence or 'any question'. The controversy in an item is really best brought out in a frontal attack under these headings.

General information on what occurs in textbooks is really never required in journals. If the writer waits he may be able to write a book of his own. The only exception is a review of certain situations in medicine and surgery. is one of the hardest feats to accomplish and should not be undertaken lightly. Most items falling under this head are returned; but when received from senior writers they are published as 'current topics, etc.'.

The original articles are always welcome provided: (1) They have a news value. (2) They add to the information already found in the literature. Only a comprehensive summary of the previous literature is not required. (3) They propound a new theory. The proof should be such as would satisfy a jury; otherwise the theory should be stated with well-expressed diffidence. (4) Speculation does not creep in except in traces. Of course, all theories start as Some remain so to the end, speculation. especially in physics. It is to everybody's advantage, however, that in a journal like ours, speculation, if not barred, should be restricted.

On the plan of drafting the narrative, of course, no rigid rules can be laid down. The sequence of events in the narrative can be so smooth as it is in a short story. The reader will anticipate the writer's words and meet him half way. Such a style, however, is a rare gift. If you possess it, display it by all means. Otherwise a step by step exposition, divided under headings and sub-headings (sub- sub-headings, if necessary), following the plan of biological classification of phyla, classes, orders, genera, species and varieties will be most helpful. The distinction between the genus and the species must be preserved. All confusion in scientific literature is caused by ignoring this precaution. The plan of numbering paragraphs decimally aims at a classification of this type but suffers from the serious flaw that it does not admit of more than 9 species under one genus. The narrative

can be split up without the decimal system using Roman numerals (large and small), Arabic numeral, and letters of the alphabet. All indicators can be used with and without brackets. Of brackets three kinds are available: square, round and linear (two long hyphens enclosing an expression in the middle of a sentence and only one at the end). The round bracket can be used as a complete set or as the end half only, inside a complete set. Adjustments of these details is as important as the kernel of the theme itself. So many books on physiology, biochemistry and pathology are difficult to follow and boring because genera and species in them have been mixed up. One does not know what is coming next and why. One is exasperated when an item is resurrected again and again. Articles on these subjects can be considerably worse. Many such articles even when printed are read by the editor only.

Theses written by young men for degrees should be held back by them for a few years in their own interest. If published forthwith, they

are likely to prove embarrassing later. Some time ago controversial topics were not welcome in this journal. The reasons behind this policy were political not scientific: they exist no longer. The tone should, of course, be dignified and worthy of a learned profession. subjects too, once upon a time, were almost confined to tropical medicine. They should no more be so confined. Without belittling the current literature coming from the West it may be said that there is no dearth of talent in any subject of the medical profession in our country, although the system controlling medical education has been decidedly faulty. Our journal should deal in all topics as do the journals elsewhere. We want more articles from more readers on more 'Reading maketh a full man; conference a ready man; and writing an exact man' -Francis Bacon.

MEDICAL EDUCATION

Ir is proposed to publish articles on the above subject as a special feature in a future issue. Contributions in this connection will be received until the 31st January, 1949. Educationists, critics and others are expected to give their best in this important subject.

Medical News

COMPILATION OF CONSOLIDATED REPORT ON THE WORKING OF AND RESEARCH CARRIED OUT BY THE SCIENTIFIC SOCIETIES AND RESEARCH INSTITUTIONS IN INDIA

(Reproduced from the Letter No. 73/G-Misc/3060, dated 7th October, 1948, from the Secretary, National Institute of Sciences of India, Delhi)

GOVERNMENT of India have decided to publish a consolidated yearly report on the working of and research carried out by the Scientific Societies and Research Institutions in India classified under the categories—(1) Government, (2) Quasi-Government, and (3) Non-Government. The National Institute of Sciences has been requested to take up the compilation of the report for the year 1947-48 on the basis of the reports to be supplied by the societies, institutions, etc., concerned. As the volume of the printed report is not to exceed 250 pages and as some 100 bodies are concerned, the report from each of the institutions, etc., should not be more than 2½ printed pages or about 7 type-written pages. At the request of the Council of the Institute, Dr. Baini Prashad, Fisheries Development Adviser to the Government of India, has kindly agreed to edit the compilation.

As the report has to be compiled and forwarded to the Government of India by the 30th of November, 1948, I am writing to request you kindly to let me have a report on your institution giving a brief review of the working of your institute and the researches which have been carried out under its ægis during the year 1947-48. The report should contain details of the subjects and the lines along which researches were carried out, and indications of the personnel, permanent or quasi-permanent, who carried out work in the institute, as also of the arrangements and facilities for such work. It would also be useful if indications could be given of the lines of work, along which the work is in progress and those in which the research programmes have been completed. A list of the publications in which the results of the work carried out have been published should also be included in your report. Finally, the extent of Government grant or financial assistance received during the year under review may also be indicated.

The report should be despatched so as to reach the office of the National Institute of Sciences, University Buildings, Delhi, by the 15th November,* at the latest.

PATENTS TO BE EXPLOITED IN NATIONAL INTEREST. GOVERNMENT OF INDIA SET UP ENQUIRY COMMITTEE

(Reproduced from the Circular No. 590, dated 1st October, 1948, of the Ministry of Industry and Supply, Press Information Bureau, Government of India, New Delhi)

THE appointment of a Committee to review the Patent Laws in India is announced by the Government of India in a Resolution in the Gazette Extraordinary issuing on 1st October, 1948.

The Committee will consist of-

- Bakshi Sir Tek Chand, Retired Chairman High Court Judge and Member, Constituent Assembly of India.
- Sir Gurunath Bewoor, Tata Indus- Member tries Ltd., New Delhi.
- 3. Major-General S. S. Sokhey, Director, Haffkine Institute, Bombay.
- 4. Mr. S. M. Basu, Solicitor, Calcutta
- 5. Mr. N. Barwell, Barrister, Calcutta
- 6. Mr. S. P. Sen, Bengal Chemical and Pharmaceutical Works, Ltd., Calcutta.

Dewan Bahadur K. Rama Pai, Retired Controller of Patents and Designs, will act as Member-Secretary to the Committee.

The terms of reference to the Committee are as follows:-

- 1. To survey and report on the working of the Patent System in India;
- 2. To examine the existing Patent Legislation in India and to make recommendations for improving it, particularly with reference to the provisions concerned with the prevention of abuse of patent rights;
- To consider whether any special restrictions should be imposed on patents regarding food and medicine;
- 4. To suggest steps for ensuring effective publicity to the patent system and to patent literature, particularly as regards patents obtained by Indian inventors;
- 5. To consider the necessity and feasibility of setting up a National Patents Trust;
- 6. To consider the desirability or otherwise of regulating the profession of patent agents:
- 7. To examine the working of the Patent Office and the services rendered by it to the public and make suitable recommendations for improvements; and
- To report generally on any improvement that the Committee thinks fit to recommend for enabling the Indian Patent System to be more conducive to national interest, by encouraging invention and the commercial development and use of inventions.

The Committee has been appointed to meet the demand both from industrialists and others for a review of the Laws relating to patents in India with a view to making them more conducive to national interests than at present.

New Delhi to be Headquarters

It is expected that the Committee will start its work at an early date with New Delhi as its Headquarters. It will visit such places as it may consider necessary and will take evidence on questions arising from the terms of reference. The Committee is authorized to call for information in writing and to take evidence from any department or officers of Government on matters which fall within its terms of reference. The Government of India hope that the Provincial Governments will afford it all the assistance which it may require and will supply it with any information which it may ask for.

Persons who desire to be called as witnesses should apply in writing to the Secretary of the Committee, c/o Ministry of Industry and Supply, Government of India, New Delhi, giving their full names and addresses, together with a brief memorandum of the points in regard to which they desire to give evidence.

REPORTED RECRUDESCENCE OF PLAGUE IN CALCUTTA

THE reports received in the first half of November do not appear to be based on facts.

Our difficulties in not being abreast with the times are specially accentuated when occurrences in November are reported in an issue dated August.

^{*}The issue of this number was expected earlier.— EDITOR, I.M.G.

Public Health Section

CORNEAL OPACITIES AMONG CHIL-DREN OF A RAILWAY COLONY IN THE DEKKAN

By E. G. H. KOENIGSFELD, M.D. (Berlin)
Late CAPTAIN, R.A.M.C.
Chief Medical Officer

and
V. G. DESAI, LCRS., DRM. & H.
Assistant Medical Officer
Barsi Light Railway Co., Kurduwadi

The high incidence of leucoma among the rural population of the Dekkan is a fact which, in our opinion, has not yet received the attention it deserves. Yet, the casual observer in Bombay Presidency will notice with astonishment that in certain up-country stations there is apparently hardly a single house where not at least one family member is afflicted by that disability. One may aptly describe the Dekkan or at least parts of it as a country of the one-eyed.

This paper deals with corneal opacities among children, up to the age of 12 years, in a railway colony of Sholapur district. The age limit was chosen, as it was impossible for us to get reliable information as to the origin of the trouble among adults who, as a rule, contracted the disability in early youth. In the case of children, on the other hand, we have been able to get most of the necessary information from our own records, as the case notes of all railway employees and their dependants are being kept at our dispensaries.

The railway colony of Kurduwadi harbours 761 children from the 1st to the completed 12th year of life. Among these children we recorded 20, who presented a corneal opacity as a result of an ulceration, i.e. a percentage of 2.6 among all children of the colony.

It is unlikely that this percentage is higher than the one to be found in the neighbouring regions of this country outside the jurisdiction of the railway. We believe, on the contrary, that it is considerably lower. The age incidence of our cases is given in table I.

Table I
Showing age incidence of children suffering from leucoma at Kurduwadi railway colony

· · · · · · · · · · · · · · · · · · ·			
From 1st to 12th month	• •		3 cases
" 1 year to 2 years	• •		3 ,,
,, 2 years to 4 years	• •		2 ,,
", 4 years to 6 years ", 6 years to 10 years	••	• •	2 "
Over 10 years	• •		7 "
over 10 years	••	• •	3 ,,

Description of corneal opacities

Three cases showed defects of both eyes; in all of them there was a dense leucoma of one

eye with the vision of the affected eye practically or completely lost, and a macula of the other eye which impaired the visual acuity, moderately.

There was, however, no case of complete blindness of both eyes observed among inhabitants of the railway colony, although we found a number of completely blind children in adjacent villages. In the remaining 17 cases only one eye was affected.

Five cases showed a complete opacity of the

cornea with staphyloma and pannus.

Four cases presented a complete or almost complete opacity with early pannus, but without staphyloma. In both these groups the visual acuity of the affected eye was nil.

Four cases showed an opacity, covering about 3rd of the cornea, and just reaching the pupillary region. Visual acuity in these cases was obviously grossly impaired, but not completely absent.

Four cases showed a partial opacity, not covering the pupillary region, with only slight impairment of the vision; 2 out of these had received early treatment in contrast to the other groups who all came late for treatment—if they came at all.

Results of general examination

Two of our cases exhibited signs of active trachoma. In 8 cases there was more or less thickening and scarring of the tarsus and inactive trachoma could not be ruled out. The 10 remaining cases showed no signs of that disease.

Conjunctivitis, usually of a moderate degree, was present in most of our cases. Smears from the conjunctive were taken whenever there was some discharge noticeable, but no special findings were recorded.

Kahn's test was done in 19 out of our 20 cases

and was negative in all of them.

Hæmoglobin was estimated in all cases according to Sahli's method. Twelve showed values of 70 per cent and more, 6 had a hæmoglobin content of 50 to 60 per cent, 2 showed values of less than 50 per cent, namely, 45 per cent and 34 per cent, respectively. The R.B.C. of the latter were 2,800,000.

Both these last mentioned cases presented other signs of malnutrition also, especially the former, a boy of 1½ years, who was mentally backward, unable to stand, and grossly underweight.

Chronic bronchitis was recorded in one case. Three children suffered from marked impetigo.

Notes on history .

All data that could be obtained regarding onset, initial signs and symptoms of the disability and treatment are given in table II.

As for other previous relevant diseases of the children under review, three had been treated for chronic otorrhea. Two had been suffering from severe conjunctivitis, which was intractable in one of them and had been present on and off from birth until the time of reviewing when the child was $3\frac{1}{2}$ years old. The same patient suffered from multiple recurrent eczematous lesions and cheilosis.

One patient, aged 9 years, was suffering from steatorrhea in early infancy and from 'enlarged liver' and ascariasis in 1943.

Two children had attacks of bronchopneumonia immediately before the onset of the corneal ulcer.

Three children suffered from severe impetigo immediately before the outbreak of the eye disease.

Opium drugging was suspected in most of our cases but could be proved in three of them only.

Marked wasting and underweight was recorded in 3 cases but probably present in many more of them.

Family histories

Eye diseases in the families of our patients were recorded in 3 cases. In the first one the patient's sister had been treated for corneal ulcer and an infant brother for gonorrheal ophthalmia; in the 2nd case, the patient's sister (who subsequently died) had been suffering from keratitis. In the 3rd case, one brother and one sister suffered from severe conjunctivitis shortly before the onset of corneal ulcer of the patient under review.

Proven gonorrhea among family members of our cases during the time of corneal ulcer or shortly before was recorded once only.

Purulent otorrhea among family members was recorded twice. In one case the patient's mother was affected during the acute stage of corneal ulcer and in the other case the patient's brother.

Discussion

The cases described present the terminal stages of corneal destruction for which a number of ætiological factors could be held responsible. Infection, of course, will have to be considered as an important factor liable to lead to the disease. Âmong the various infections which may cause corneal ulceration, trachoma is probably the most likely one, at least in this part of the country. Among our cases, however, only two showed signs of active trachoma, whereas seven more exhibited thickening, scarring of the tarsus. It should, however, be borne in mind that signs of inactive trachoma, i.e. thickening of the tarsus, are extremely common here among the population; such a condition is known to exist not seldom without interference with the patient's health and often unknown to him. Therefore, the view cannot be easily dismissed that in our cases also trachomamay have been an accidental concomitant.

Syphilis does not seem to be a causative factor for the condition of our cases. There was neither clinical nor serological evidence of it.

Gonorrhea was originally believed to play a major rôle in the ætiology, a view which was likewise not borne out by our investigation.

Infection with other germs, e.g. pneumococci or streptococci, must certainly be held responsible, partly at least, for the clinical picture of some of the cases, but it is open to question whether this has been the decisive factor in the ætiology.

In not less than 15 out of our 20 cases it was found that the general condition of the patients was far below par. In 6 cases, malnutrition, scarring of the tarsus and considerable anæmia were found on examination, whereas 9 cases gave histories of either severe general infection or malnutrition synchronizing with the first attack of keratitis.

These findings appear significant. There can hardly be any doubt that nutritional deficiencies played a dominant rôle in the ætiology of our cases; but it is a matter of speculation what deficiencies were actually responsible for the clinical pictures of our cases.

Vitamin A deficiency was held responsible by the Government of Bengal Sanitary Board Nutrition Committee (1940) among other conditions for xerosis, intractable keratoconjunctivitis in children and keratomalacia.

Lack of vitamin B has been blamed, by the same body, for conjunctival and corneal dystrophy, and vitamin C deficiency for keratoconjunctivitis with tendency to ulceration of the cornea

Ariboflavinosis has been mentioned by Eddy and Dalldorf (1941) as ætiological factor for photophobia, burning of eyes, conjunctivitis, corneal vascularization and corneal opacities.

It appears to us that the disability was caused by the lack of more than one nutritional factor, and it may therefore be advisable to treat cases of corneal ulcer, where there exists a suspicion of a nutritional ætiology, with a balanced diet and multi-vitamin preparations. This we have done in all recent cases under our care.

In this context it may perhaps be of interest to note that among a series of adult patients suffering from macrocytic anæmia and malnutrition, we have frequently found, like other observers before us, a severe painful conjunctivitis and extreme dryness and occasional superficial ulceration of the cornea. This condition subsided, as a rule, under proper diet and anti-anæmia and vitamin treatment, the only local treatment being castor oil instillations into the eyes.

It may be appropriate to report in this connection briefly on a recent fatal case which did not belong to our railway colony and therefore could not be included in our series.

initials	Age		Data at	- William at beginning of	'
		Sex	Date of onset	Eye condition at beginning of treatment	Notes on treatment
R. G.	7 years	F.	1944	Keratitis punctata*	Regular treatment given at Kurduwadi Dispensary fron onset: Argyrol and atropine instillations.
B. D.	9 Years	M.	? Before 1943	Not seen at onset. Seen for the first time in 1943 when a large corneal opacity was	Nil.
ſ. Y. A.	9 years	M.	Sept. 1947	present. Phlyctenæ which ulcerated a few days after onset.*	Regular treatment given—a Kurduwadi Dispensary from onset. Orally: Shark live oil emulsion with calcium Locally: Calomel, late argyrol. After detection oulcer: Penicillin injections intramuscular.
I. N. B.	8 years	F.	Insidious onset April 1946.	Not seen at onset. At first consultation (10-5-46) a corneal ulcer and hypopion was observed.	Treatment irregular and belated. Orally: Sulpha diazine from 22nd to 26th May. Locally: Atropine and argyrol instillations. Shock treatment with milk injections.
P. M. L.	3½ years	M.	? Aug./Sept. 1947.	Not seen at onset: at first consultation (Oct. 1947) a large leucoma was present (intractable conjunctivitis off and on since birth). Had a relapse of corneal ulcer in January 1948 which resulted in panophthalmitis.	(Treatment started only in January 1948 after onset of panophthalmitis): Penicilli injections and dressings.
8. R. V.	7 months	М.	Oct. 1947	Onset with severe conjunctivitis. Patient was brought for 2nd consultation only after several weeks when a large corneal ulcer was present.	Locally: Silver nitrate, atro- pine. Orally: Shark live oil/calcium emulsion. Sys- temically: Penicillin injec- tion. After acute stage Shock treatment with mil- injections.
м. К. В.	1½ years	М.	1947	At first consultation (26-12-47) fully developed corneal opacity. Patient had intractable conjunctivitis several poor to disability	Protargol locally. Shark live oil orally. Shock treatmen with milk injections.
•	•]	M.	Feb. 1947	At first consultation (March 1947) fully developed corneal	ment. Orally: Shark live
		1,1.	Oct. 1947	At first consultation (2-11-47) fully developed corneal	Argyrol locally. Shark live oil orally. Shock treatment with milk injections.
			and Sept. 1936.	At first consultation (19-9-46) fully developed leucoma and	Nil.
•	9 months	F.	Dec. 1947.	At first consultation (about 2 weeks after onset) large corneal ulcer with hypopion.	oil, iron marmite. Penicilli systemically and a course (sulphadiazine. After acut stage: Shock treatment wit
]		M.	Between April		milk injections.
1	Jours	M	Sept. 1942	At first consultation (19-9-42) corneal ulcer and folliculosis. Left eye and macula of	Locally: Silver nitrate. Systemically: Shock treatment with milk injections.
		M.	July 1946	At first consultation (about 2 weeks after onset) corneal ulcer.	Locally: Atropine, silve nitrate. Orally: Sulphon amide. After acute stage
S. J. B	11 years	F.	Aug. 1936	At first attendance diffuse haziness of right corner which soon developed into	Milk injections. Locally: Silver nitrate. Sylver reminally: Short territory
	. N. B M. L R. V A. V. L A. U. H M. R. L K. S. M . P. B. V. A. M. H. S.	. N. B. 8 years . M. L. 3½ years . M. L. 1½ years A. V. L. 1½ years A. U. H. 8 months M. R. L. 12 years K. S. M. 1 year 9 months P. B. V. 12 years A. M. H. 5 years M. H. S. 2½ years S. J. B. 11 years	. N. B. 8 years F. . M. L. 3½ years M. M. K. B. 1½ years M. M. K. B. 1½ years M. A. V. L. 1½ years M. A. U. H. 8 months M. M. R. L. 12 years F. K. S. M. 1 year F. 9 months P. B. V. 12 years M. A. M. H. S. 2½ years M. M. H. S. 2½ years M. S. J. B. 11 years F.	. N. B. 8 years F. Insidious onset April 1946. . M. L. 3½ years M. ? Aug./Sept. 1947. . R. V. 7 months M. Oct. 1947 M. K. B. 1½ years M. 1947 A. V. L. 1½ years M. Feb. 1947 A. U. H. 8 months M. Oct. 1947 M. R. L. 12 years F. Between Jan, and Sept. 1936. Dec. 1947. K. S. M. 1 year F. Dec. 1947 A. M. H. 5 years M. Between April and July 1935 Sept. 1942 M. H. S. 2½ years M. July 1946 S. J. B. 11 years F. Aug. 1936	a large corneal opacity was present. N. B. S years F. Insidious onset April 1946. M. L. 3½ years M. ? Aug./Sept. 1947. M. L. 3½ years M. ? Aug./Sept. 1947. R. V. 7 months M. Oct. 1947 M. K. B. 1½ years M. 1947. M. K. B. 1½ years M. 1947 A. V. L. 1½ years M. Feb. 1947 A. U. H. 8 months M. Oct. 1947 A. U. H. 8 months M. Oct. 1947 M. R. L. 12 years M. Peb. 1947 M. R. L. 12 years M. 1947 M. Sept. 1947 M. Sept. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 M. G. L. 1947 M. Feb. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 M. G. L. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 M. Sept. 1947 A. U. H. 8 months M. Oct. 1947 A. U. H. 1½ years M. Feb. 1947 A. U. H. 8 months M. Oct. 1947 A. U. H. 8 months M. Oct. 1947 A. U. H. 1½ years M. Feb. 1947 A. U. H. 1½ years M. Feb. 1947 A. U. H. 8 months M. Oct. 1947 A. U. H. 1½

TABLE II-concld.

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No.	Initials	Age	, Sex	Date of onset	Eye condition at beginning of treatment	Notes on treatment
16	S. S. R.	10 years	F.	Left eye: Nov. 1937. Right eye: Sept. 1938.	Left eye: At first attendance (about 15 days after onset) large corneal ulcer. Right eye: At first attendance superficial corneal ulcer.	Systemically: Shock treat-
17	В. Е. Т.	9 years	М.	March 1941 ·	At first attendance large corneal ulcer.	Locally: Silver nitrate, atro- pine. Systemically: Shock treatment with milk injec-
. 18	R. G. G.	3 months	F.	Dec. 1947	At first attendance 18th February, 1948. Fully developed opacities of both eyes. Staphyloma right eye.	tions. Locally: Silver nitrate, atropine. Orally: Shark liver oil. Systemically: Shock treatment with milk injec-
19	I. A. H.	6 years	M.	Feb. 1945	Onset with severe conjunctivitis for which patient was brought to dispensary very irregularly. Treatment was interrupted against medical advice and resumed only when opacity of left cornea	tions. Locally: Protargol. Yellow oxide ointment. Orally: Shark liver oil.
20	C. P.	9 years	М.	? 1939	present.	Not under treatment at Barsi Light Railway Dispensary.

Case report

A female child, aged 4 years, was brought to the Barsi Light Railway Hospital, Kurduwadi, on 13th April, 1948, in an extremely anæmic and wasted condition, weighing 15 lb. only. Both eyes were sunken and showed deep and extensive corneal ulceration, the right cornea being already perforated. The R.B.C. were 2,000,000, Hb. 40 per cent; stools were frequent and watery, urine contained pus cells ++, temperature. 101. According to mother's statement the child had been fed on jowar bread only (?) with the occasional addition of a few vegetables. The treatment which was started immediately on the lines indicated above, including systemic penicillin, was in this advanced case of malnutrition without avail, and the child died shortly This admission from wasting. illustrates well the nutritional ætiology of the disability, presenting a syndrome of severe with anæmia, gross wasting corneal ulceration leading to blindness and death.

A few words may be said on the climatic conditions which may be liable to contribute to the disability. The villagers blame the dusty, dry weather, prevalent here during the major part of the year, for the condition, and it cannot be denied that conjunctivitis may be caused or aggravated by such a climatic situation. A decisive factor, however, cannot be seen in it, as the disability affects almost exclusively the poorer classes only.

A traumatic origin could be traced in one single case and requires no further discussion.

Almost all cases were late for treatment. Only two reported in time and remained under regular supervision of our medical staff; in these cases the area of corneal destruction was comparatively small and the impairment of vision

only slight.

At present, our treatment of fresh cases of keratitis or conjunctivitis with probable corneal involvement is general as well as local. If there is any evidence of severe malnutrition, the patient is kept in hospital and the nutritional deficiency, as mentioned above, is corrected by appropriate diet, multi-vitamin preparations, and if necessary, iron and liver. Local treatment is given on the lines indicated in the table. If a penicillin-susceptible organism is supposed or proved to be a factor in the ætiology of the disease, penicillin is given systemically.

The results of our management are difficult to assess, but a considerable number of cases of severe kerato-conjunctivitis heal completely under this treatment, and during the past year we had not a single case of corneal opacity which developed while the patient was under our care. All our cases which resulted in leucoma had their corneal ulceration of leucoma well established when they first came for treatment.

This would indicate that the disease is preventable, if only medical aid is available at an early date, especially in cases of severe conjunctivitis. If the necessity of early and adequate treatment can be successfully impressed on the patient's attendance, a good deal of the doctor's job is already done. The actual treatment is simple and can be carried out in any dispensary.

Summary

Corneal opacities have been found in 2.6 per cent among all children under 12 years in a railway colony of the Dekkan.

The main atiological factor of the disability

is seen in malnutrition.

The disability is predominantly a social evil due to poverty and neglect.

We wish to express our gratitude to the medical staff of the Barsi Light Railway Co., especially to Dr. G. Daniel, L.C.F.S., for valuable assistance and keen interest in our investigation.

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The Indian Medical Gazette Fifty Pears Ago

MEDICAL EDUCATION IN INDIA (Reprinted from the Indian Medical Gazette, Vol. 33, August 1898, p. 292)

WE have seen recently a circular issued by the Council of the 'Indian Medical Association' calling attention to several points in medical education and degrees as obtained in this country. Many of these points are worthy of attention; and the fact that this Council lays claim to represent the medical profession in India, a claim to which they cannot be said to have any right, can be put on one side for the present, as it does not detract from the import-

ance of the questions raised.

The first of them that we may consider is the standard of preliminary education and the inequality of the preliminary examinations demanded by the different Universities. On this we cannot but agree that it is extremely desirable that this standard should be sufficiently high and uniform, but, unfortunately, in Bombay at all events, it is the local medical profession who have prevented the establishment of such uniformity. When the different schemes were brought forward by Brigade-Surgeon Wellington Gray, Drs. Maconachie, Khory, Bahadurji and others, it was found impossible to get anything like agreement; and it was argued that the papers for the Matriculation of the Bombay University proved that their standard was equal to that of the London Matriculation, if not higher: as if, indeed, the standard of any examination is shewn by the nature of the questions asked. It is one thing to put difficult questions, but the examiner does not necessarily require a very high standard of answer. This sort of argument was, however, sufficient for men who had made up

their minds beforehand on which side they were to vote. And indeed the bias shewn, on the occasion referred to, pretty well proves the inability of the senate of an Indian University to fairly consider the whole question. In our opinion the First Arts of the Calcutta University, with perhaps the test in English somewhat altered, would be a sufficient examination for a medical qualification; but in truth something more than mere scholastic attainment is necessary to make a comparison with European students possible. The conditions of life in which) the majority of Indian students live at present render this unattainable; and we need not go into the point which appeared some years ago to give offence where it was not intended, and to lend acrimony to the discussion. In fixing a uniform preliminary examination, what we want is a fair, all-round test, but not one of

any great severity.

We will next consider the nature of the qualification to be obtained at the end of the appointed medical curriculum; here again the Council points out the desirability of uniformity. In Great Britain the one portal system has frequently been under consideration; the number of different diplomas and the difference in their value are and must be most perplexing to the public and to parents who wish to send their sons into the medical profession. It certainly is to be hoped that a similar condition of things will not be allowed to obtain in India. Already there are too many, and the reference made to the diplomas indicated by the letters V.L.M,S. and L.T.M.S. by the Council is to the point. It would be better indeed if medical qualification were in future only to be obtained at the Universities, after examinations and curriculums of absolute uniformity in the different Présidencies, all other diplomas should be abolished. The public would then be able to form a better opinion of the nature and standard of medical diplomas; at present they regard some of them as little better than fraudulent titles. So much for the ordinary medical student and his examination.

As regards the military medical pupil and the hospital-assistant, we do not consider that it is at all necessary to lengthen the curriculum or alter their qualification. The military medical pupil is educated for a particular position by Government, which very generally pays him as well. We doubt if any such advantages can be obtained under any other Government in the world; the sons of very often poor, but respectable, people are provided with a career, and not only that, but are educated for it. For the purpose for which these lads are educated, we are of opinion that a four-year course is a sufficiently long one; the qualification which they receive is one which allows them to practise in the service. It would perhaps be better to limit their practice to the service only; but when a man is desirous of practising in public, it should be possible for him to complete, at his own

expense, a medical course in all respects the same as that of the civil medical pupil. This should be allowed after a certain number of years have elapsed from the time that he entered. It appears unfair to educate men gratuitously and make it possible for them to compete with men who have had to pay for the whole of their medical education.

The same may be said as regards the hospitalassistant class; no very high standard of general education is required for them. They fulfil very fairly the services for which they are required; they are not, however, too highly paid. On the other hand, some of them are able to increase their pay by private work. Here, again, it is perhaps not desirable that they should compete with local graduates; they were educated specially for service requirements. out-of-the-way-places their services may be required by the public, when it is impossible to secure those of a civil practitioner; and under these conditions rules might be laid down to which strict attention would have to be paid, otherwise any breach of them could easily enough be brought to notice. It appears to us, too, that the statements made by the Council with regard to the appointment of professors are considerably exaggerated. Due attention is paid to selection for these appointments by the authorities; but it is perhaps impossible to altogether prevent changes which the exigencies of the service may necessitate; at any rate, these very statements tend to shew that there is not much danger of professorships being held for too long, in fact the age rules of the service prevent such an occurrence, and there is little doubt but that the same rules might apply also to all Europeans and Natives holding teaching appointments. In this country the mental faculties are not active for so long as in colder climates. If a man in the service is considered unfit at a certain age, the same may be said of another who is not in the service himself; the fact of his being or not being in the service does not affect his mental capacity at a certain period. It seems to us that the Directors of Public Instruction in conjunction with the Principals of the various colleges could very well make up a scheme which would cover the whole ground of medical education, and the due observance of rules for medical practice might be enforced by Government, in whose hands the working would be much more efficient, and the power of punishing offenders would be very much greater than those of a General Medical Council. It may be said that in England the General Medical Council only exists because the Government will not take up this matter. There are many in the medical profession at home who think that the interests of the medical profession should be entirely in the hands of the Government, and that quacks and all kinds of practitioners not possessing proper qualifications would then cease to exist. Stringent rules for this purpose would have to be made, but when made there

would not be much difficulty in having them attended to. The General Medical Council can do little but regulate medical education and punish the offences of any member of the profession to a certain extent, but it is powerless to prevent the army of quacks from preying on the public, and the only course seems to us to be that the regulation of education and medical practice should be entirely in the hands of Government. It remains therefore for the profession to endeavour to get Government to take up this matter thoroughly. This it may possibly do if the whole question is placed before the authorities in a proper light and well supported by the whole body of medical practitioners.

Current Topics, Etc.

Nitrogen Mustard Therapy in Cutaneous Blastomatous Disease

(Reprinted from Medical Newsletter No. W.599, dated January 1948, prepared by the American Medical Association and supplied by the U.S. Information Service, New Delhi)

Osborne, Jordan, Hoak and Pschierer reported on the use of nitrogen mustard in five patients, two of whom were cases of mycosis fungoides, one of lymphosarcoma involving the skin, one of Kaposi's hemorrhagic sarcoma associated with Hodgkin's disease and one of chronic disseminated lupus erythematosus. It was the conclusion of the authors that there was no question but that the mycosis fungoides responded dramatically to the use of nitrogen mustard therapy. They stated that they believe the effect of the therapy will be only temporary as in one case they have already had recurrence of nodules four weeks after cessation of treatment.

In one case the diffuse erythroderma, which did show positive pathologic evidence of mycosis fungoides, although improving at least 90 per cent, still showed characteristic pathologic changes of the disease. The authors believe that the value of nitrogen mustard therapy in the treatment of this disease is limited principally to patients with far-advanced lesions and lesions involving internal organs which cannot be adequately treated with roentgen therapy or with patients in whom the disease had become resistant to further radiation. The most immediate and dramatic effect of the nitrogen mustard was the early relief of intolerable itching which was thought to have a great psychologic effect on the patient.

The response of the cutaneous lesions in the case of lymphosarcoma was most dramatic. The pathologist was unable to find any gross or microscopic evidence of the disease, either in the skin or other tissues, 12 days after treatment. In the one case of multiple hæmorrhagic sarcoma of Kaposi, there was no response either clinically or microscopically to the use of nitrogen mustard therapy.

The patient with chronic disseminated lupus erythematosus was given only three-fourths of the usual dosage of nitrogen mustard. The patient continued to improve throughout treatment and her skin is now free of all eruption except a few areas of chronic discoid lupus erythematosus on the face and neck. She gained ever 30 pounds in nine months.

over 30 pounds in nine months.

The authors do not advocate the use of nitrogen mustard therapy in disease of a chronic inflammatory nature and suggest a need for further study along this line. However, they believe that with development of

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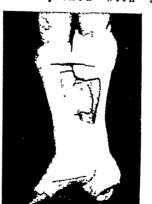
SKIN ULCERATION

A cross-leg flap graft and immobilisation with Gypsona.



During these ten months he had numerous sequestra from the fracture site and when healed the ulcer Fig. 1 everything else had remained at the inner side of the junction of the middle and lower thirds of the leg. On the 30th October he was admitted to hospital. The skin around the ulcer least 2" was found at least 2" was found to of poor quality. Radical excision for be ulcer and surrounding area of unstable was performed. cross-leg flap form opposite calf was

into the defect. sutured donor area was covered The raw with thin razor graft, with tulle gras (Jelonet), applied Gypsona plaster bo dressed Previously applied Gypsona plaster boots were joined



with additional G урвопа bandages. After three weeks the plaster was removed and three days later the divided. Ttwo months the flap was



completely healed and the patient discharged. The details and illustradischarged. The details and mustrations above are of an actual case. T. J. Smith & Nephew Ltd., of Hull, England, manufacturers of Elastoplast, Jelonet and Gypsona, publish this instance—typical of many in which their have been used wit products with



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new drugs in the same series safer dosage of those compounds may prove of value in treating some of the resistant inflammatory dermatoses.

(Osborne, Earl D., University of Buffalo, School of Medicine, Buffalo, N.Y., Jordan, James W., Hoak, Frank C. and Pschierer, Francis J.: Jour. Amer. Med. Assoc., 135, 1123-1128, December 1947.)

The Treatment of Anuria

(From the Mcd. Jour. of Australia, Vol. 2, 1947, p. 48)

Controversy can still easily be raised about anuria, and even in some of the questions of principle underlying treatment agreement has not been reached. For example, correspondence in *The Lancet* between R. A. McCance and D. A. K. Black, and B. Maegraith and R. E. Havard had recently shown how authorities may differ concerning alkalosis and renal failure. The concection is admitted by both pairs of authors to be difficult to explain, but though the pathological background may differ in various types of renal failure, the aim of treatment is to restore glomerular flow.

Some interesting work has been published on the effect of infusion fluids and diuretics on the anuria resulting from severe burns by William H. Olson and H. Necheles. They have previously studied anuria in experimental shock, and differentiated three types, those occurring in burns, in crush injuries and in the presence of reduced blood volume, as in become the content of the co presence of reduced blood volume, as in hæmorrhage. Since anuria resulting from burns can be more easily studied experimentally, it has been selected for the purposes of this study. The authors refer to the findings in some of the victims of the Cocoanut Grove disaster, in whom hæmoglobinæmia and hæmoglobinuria followed severe thermal trauma. This form of anuria has aroused a great deal of attention during the war, for unfortunately, there have been many opportunities of studying the effects of severe burns. The features of the anuric syndrome occurring also in crush injuries of the limbs and in intravascular hæmolysis are very similar. Undoubtedly there is the common factor in all of a rapid and sudden destruction of the red blood cells, presenting the anoxic and sometimes poisoned kidneys with the burden of dealing with the excretion of hæmoglobin, myoglobin and the products of cellular breakdown. The present study was designed to shed light on the effectiveness or otherwise of the various infusion fluids that have been recommended, and also on the use of alkalis and diuretics. The work was carried out on dogs subjected to a degree of thermal trauma that was found adequate to produce anuria. The animals were, of course, kept under deep anæsthesia throughout. The renal excretion was estimated directly by observing the flow from cannulas in ureters, and the amount of free hæmoglobin and plasma, determined and hæmatocrit readings made. A very wide range of infusion fluids was used, including plasma, the various combinations of saline with other salts, glucose, alkalis such as bicarbonate of soda and lactate solutions, and sodium sulphate. To these were also added in some experiments diuretics, such as urea, caffeine, aminophyllin and mercurials. Gelatine and different vitamin supplements were also tested. One of the most outstanding findings was the success attending the use of sodium sulphate in isotonic solution, contrasting with the inferior results obtained from alkalis, despite the widespread sanction for their employment. The authors quote Maegraith and Havards' well-reasoned warning against the risks of Havards' well-reasoned warning against the risks of alkalis, which was directed particularly to the treatment of blackwater fever, a condition which interested Australian physicians during the island campaigns. Of course, as Olson and Necheles point out, the risk of producing alkalosis in impending or actual renal failure has been recognized by many authorities, and Olson and Necheles quote the work of the British Army Malaria Research Unit which showed that large doses of alkalis adversely affected the renal capacity of even healthy men.

Without entering the present controversy concerning the mechanism of impairment of renal function in the presence of hæmoglobinæmia and hæmoglobinuria, we may at least take due heed of the relative ineffectiveness of alkalis in the present experiments. In presenting a summary of their work Olson and Necheles state
that they found plasma and saline solution the least
effective of all fluids tried for infusion in an attempt
to combat anuria. Better results were obtained from
sodium lactate, dextrose in Ringer's solution, 2 per cent
uria in saline solution, and normal saline solution with
0.87 per cent of sodium bicarbonate added. But more
effective than all these was isotonic solution of sodium
sulphate, which succeeded in overcoming anuria in
every case in which it was tried, the most severe being
in one animal whose plasma contained over 4,000 milligrammes per centum of hæmoglobin. Where complete
anuria existed, an effective renal plasma flow was
restored, and an even greater improvement was seen
in the glomerular filtration rate. No favourable results
were observed from vitamins or diuretics; when the
kidney impairment was great, the diuretics failed to
justify their names. Since good results have been
previously reported from the use of sodium sulphate
in the anuria of the crush syndrome, and since the
value of this substance for this purpose is already well
known in clinical medicine, the authors seem to be
justified in their recommendation of its use in the
treatment of anuria occurring after burns, and of other
related types of renal failure.

To-day's Treatment of Syphilis

By P. A. O'LEARY

and

R. R. KIERLAND

(Abstracted from the Journal of the American Medical Association, Vol. 132, 26th October, 1946, p. 430)

The evaluation of penicillin in the treatment of patients with syphilis is still going on and must continue for several years more before concrete deductions may be made as to its actual value. Penicillin has the following advantages: it produces few reactions and it can be given in a short period of time. The need for hospitalization for a week or ten days and injections given at two- or three-hour intervals are its disadvantages. It may be that penicillin in beeswax and peanut oil will overcome these objections.

In the treatment of early syphilis the results from penicillin are inferior to those from five-day drip or multiple daily injections with syringe of arsenoxide (oxophenarsine hydrochloride). However, the complication rates from these procedures are so high and serious that they prevent their general use. Penicillin in combination with oxophenarsine hydrochloride and a bismuth preparation given either before or after or concurrently offers at this time the highest rate of success from treatment in patients with early syphilis. The shorter the duration of the syphilis the better are the results from treatment employing penicillin alone or amplified by chemotherapy.

alone or amplified by chemotherapy.

In late cutaneous, osseous and gastric syphilis and in early hepatic syphilis the results from penicillin therapy are excellent, while in late latent and cardio-vascular disease sufficient experience has not yet been accumulated to warrant an opinion as to its eventual value. In neurosyphilis the meningeal types of the disease respond well, while the parenchymatous forms are more resistant to penicillin. After penicillin therapy the serologic reversals have been more satisfactory thus far than the clinical improvements. Penicillin and malarial therapy produce more serologic and clinical improvement than fever therapy alone or penicillin alone. Results from the treatment of neurosyphilis with penicillin are still unpredictable and somewhat erratic.

The single outstanding value of penicillin is observed in the treatment of pregnant syphilitic women. Penicillin therapy (seldom, fails to prevent the development of syphilis in the offspring. In congenital syphilis the results from treatment with penicillin are as yet somewhat variable, and there is need for the treatment and

observation of more patients before an estimation of its value is made.

Although the exact status of penicillin therapy in syphilis is not known to-day, it is apparent that penicillin has definite therapeutic merit, that it produces few reactions, that it can be given in short courses with minimal technical difficulties and that the cost of treatment eventually will be less than that of chemotherapy.

Treatment of Rodent Ulcer by Injection of Methylene Blue and Hydrogen Peroxide

By R. PAKENHAM-WALSH

(Abstracted from the Medical Press, Vol. 217, 26th March, 1947, p. 246)

METHYLENE blue has some action on the metabolism of malignant growths which may be attributed to its chemical property of acting as hydrogen acceptor. As hydrogen peroxide also acts in a similar capacity, it occurred to the author that a mixture of these two substances might seriously disturb the metabolism of any growth in which anaerobio respiration plays a prominent part.

The mixture, consisting of 1 per cent methylene blue with an equal part of hydrogen peroxide (20 vols.), was first injected into advanced malignant growths of the breast which were inoperable, and the local regression which followed induced the author to try the same

treatment on rodent ulcers.

Three of the latter cases so treated proved to be a complete success, but in two of them the original growths were small and a biopsy was not made. In the remaining case, however, the diagnosis was con-firmed by microscopic section, and the treatment of this

patient will be described in detail.

A chronic mental female patient, aged 69, was noticed on 10th July, 1945, to have a small nodule behind the lobe of the right ear about the size of a large pea. A section was sent to the Lancaster Royal Infirmary for diagnosis, and the report returned was: 'This is a rodent ulcer'. The growth was injected with ½ c.c. of the methylene blue and peroxide mixture (i.e. \(\frac{1}{2}\) per cent methylene blue and 10 vols. peroxide after mixture) on 23rd. Injections of 1 c.c. of the same mixture were repeated on 24th and 30th November, 1945, 7th December, 1945, 8th January, 6th February and 13th March, 1946. The growth first became smaller, then sloughed, and finally left a clean scar. The patient shows no evidence of a recurrence shows no evidence of a recurrence.

Similar results were obtained with the remaining two cases in which the diagnosis was not confirmed by microscopic section. These were more difficult to treat, as they were on the face, which was liable to become inflamed, and sulphamezathine was used when this complication occurred. Another alarming feature was the puffiness of the face due to the collection of oxygen under the skin, but experience showed that this rapidly subsided without ill effect. The intervals between the injections in all three cases were determined by the

amount of reaction and the response to treatment.

This brief report has been submitted for publication on account of its theoretical implications, which may throw some light on the biochemical nature of malignancy. From the practical point of view, however, the method of treatment described might be of value: (a) when the standard radium treatment was not available, and (b) for the treatment of an ulcer so close to the eye that the latter might be injured by the

radium emanations.

Fatal Delayed Shock after Penicillin

(Abstracted from the Medical Press, Vol. 217, 29th January, 1947, p. 88)

Gordon (J. Amer. Med. Assoc., 29th June, 1946) reported cases. A middle-aged man, in previously good

health and without history of asthma or allied disorders, underwent a subtotal gastrectomy for carcinoma ventriculi. After excellent immediate operation results and 'as sulphonamide drugs had not been used' in any part of the operative field, 'the patient was immediately put on penicillin, receiving 30,000 units every four hours'. All was well to the fifth day, when signs typical of anaphylactic shock appeared and a sharp rise of temperature. Two days later he died. Definitive reasons for the diagnosis given include: (1) the unpredictableness of the reaction; (2) the character and intensity of a scarlatiniform rash observed; (3) the high temperature and other overwhelming symptomatology (Selye's alarm reaction); and (4) the ultimate and rapid fatality.

Fatal Anaphylactic Shock

(Abstracted from the Medical Press, Vol. 217, 29th January, 1947, p. 86)

DEATHS due to the injection of foreign protein in man are fortunately few. In 1942, Kojis ('Serum Sickness, etc.', J. Dis. Child., 64, 93) found records of

61 such deaths.

Death of identical twins after a second injection of diphtheria toxoid and pertussis antigen, alum precipitated, was reported by Werne ('Fatal Anaphylactic Shock', J. Amer. Med. Assoc., 131, 732, 1946). Males, aged 10 months, apart from vomiting in one and restlessness in the other, nothing untoward followed the first administration one month before. A latent period of 'about an hour' preceded the progressive development of 'shock' symptoms.

Acute disseminated vascular injury was the consistent finding at autopsy. Widespread contraction of smooth muscle, and incressed expillery permeability eaving

muscle and increased capillary permeability, causing death by asphyxia and dilatation of the right ventricle, were the cause of death in each case. Treatment was of no avail, the arterial spasm and increased endothelial permeability being too widespread to respond to the adrenaline and allied 'anti-shock' methods instituted.

These cases serve as an additional warning to those who 'mix the germs' indiscriminately.

The following two items are reproduced from Medical Newsletter No. W-507 dated December 1947 prepared by the American Medical Association and distributed by the U.S. Information Service, Calcutta.

Psychosomatic Medicine That Every Physician Should Know

ALVAREZ shows that every physician must know much about psychosomatic medicine if he is to avoid making many diagnostic mistakes, ordering many futile operations, and scaring half to death many organically sound patients.

He must see that many of his patients are ill because of inborn nervousness, constitutional frailness, excessive worry or excessive strain. He must see also that none of the tests on which he so relies for a diagnosis will reveal a neurosis or psychosis or nervous breakdown. There is still great need for taking a good history

and for sizing up the patient.

Many discomforts in the thorax or abdomen arise in the brain and are referred out to the periphery. Most of the feelings of chronic fatigue and ill health probably arise in the brain.

It should be remembered that for every one of the income and the psychographic there are a

million of the insane and the psychopathic there are a number or near relatives suffering from equivalents, such as chronic invalidism, unemployability, alcoholism, vagabondism, criminality, deaf-mutism or bad stammering. Many of these relatives are the so-called chronics who fill the waiting rooms of physicians.

Physicians have long thought insanity was no concern of theirs; to-day they are beginning to see that from the fringes of the huge reservoir of psychopathy they are getting a high percentage of their most troublesome patients. To-day, physicians are beginning to see that there is a type of psychiatry that is their concern and

which they must practise.

Recently three important points have come home to the medical profession: (1) that a poor nervous inheritance, unhappiness and strain can cause neuroses;
(2) that they can bring to light organic disease or
cause flare-ups of such disease; and (3) that in many cases of organic disease the symptoms are all those of

a complicating neurosis.

A study of consultant practice and the many poor results of abdominal surgery reveals that there is still great need for improvement in the recognition neuroses and the avoidance of futile laparotomies.

One cannot trust one's ability to diagnose a neurosis or psychosis by exclusion because too many inconsequential findings are disclosed by the examinations. One of the greatest arts needed in medical practice to-day is that of disregarding findings which cannot explain the symptoms. Every good physician must, willy-nilly, become a psychiatrist. The family physician must more often stick to his impression that the patient is neurotic and the syndrome functional in nature. All neurotic and the syndrome functional in nature. All physicians need more training in recognizing promptly the common neuroses just as they recognize whooping cough the minute they hear it. They must recognize nervous breakdowns, tired vision, air hunger, hyperventilation, globus, nervous whispering, palpitation, regurgitation, abdominal quivering, repeated belching, heart-burn, nervous bloating, the 'sore colon' syndrome, nervous diarrhœa, nervous types of pain, the nervous bloadder, psychosomatic rheumatism. migraine, the 'nerves playing tricks' syndromes and equivalents of nerves playing tricks' syndromes and equivalents of epilepsy.

When a physician decides that he is going to give his nervous patients a better deal, perhaps the first thing to do is to decide that he will never again consciously resort to a placebo of diagnosis to get the patient quickly out of the office; he will say either that he does not know exactly what the trouble is or that he thinks that it is functional or nervous in origin.

With friendly, sensible treatment, many neurotic persons can be greatly helped; they can be induced to start rebuilding their lives, and they can be taught to hoard their energies and to become useful citizens again. Some of the best work of this world is done by weaklings, constitutionally inadequate and psycho-pathic persons who have found a job that they can do—that is within their slender means of strength and that does not involve too much conflict with themselves

and others.

Before we can help such persons we must listen patiently to their stories and must learn about the forces in them and their surroundings that cause disturbing conflicts and unhappiness; we must learn about the annoying boss, or wife or mother-in-law or the distressing inferiority complex. We must constantly strive to avoid committing the besetting sin of the would-be psychiatrist, which is to talk much and to listen little—to tell the patient what he is thinking and why he is doing what he is doing rather than to ask him what he is thinking and why he is doing things that are foolish.

Advice must always be practical. Our speech must also be simple and colloquial, and we will do well to drive home our points with short illustrative stories. To be sure all of this takes time, but is worth while when, as often happens, we succeed in giving back health and happiness to some previously much puzzled and confused human being. Actually, health-giving psychotherapy often takes much less of the physician's time than would months of futile 'shots' or dosing with sulfonamide compounds and penicillin, or trying to combat symptoms when the patient keeps returning disgruntled after a useless operation.

(Alvarez, W. C., Mayo Clinic, Rochester, Minnesota: Journal of the American Medical Association, 135, 704-708, November 1947.) also be simple and colloquial, and we will do well to

The Diagnostic and Therapeutic Value of Liver Biopsies with Particular Reference to Trocar Biopsy

VOLWILER AND JONES show that the multiplicity of the liver's functions and its notable reserve capacity are such that at best, even when the entire battery of laboratory studies is employed, an imperfect set of

findings is obtained.

Investigators have made an effort to obtain exact histologic information by means of liver biopsy. authors also have been interested in a histopathologic study of liver disease and have found, as others have, that such knowledge is frequently vital in making correct clinical decisions. The following conditions must be satisfied to justify liver biopsy: the procedure must present no undue risk to the patient, and the material so obtained must be adequate for histologic examination.

In general, all three of the present-day methods (laparotomy with small incision under local anaesthesia, peritoneoscopy and needle biopsy) fulfil both these requirements. The authors show that needle biopsy of the liver has advantages over the other two methods. When properly performed, it usually causes little discomfort and, if a fairly uniform pathologic process is present, provided a satisfactory sampling of tissue from deep within the liver substance.

The authors describe the technique of and the indications for the use of needle aspiration biopsy.

They have performed 234 such procedures with 0.5 per

cent mortality. Of the total number, 216 provided sufficient tissue for adequate histologic appraisal; in 79 cases the biopsy was essential to an accurate clinical

diagnosis.

It is believed that aspiration liver biopsy will furnish the following practical information: correct differentiation of extrahepatic and intrahepatic biliary obstruction when clinical and laboratory data are inconclusive; exact diagnosis of the type of diffuse intrahepatic disease; determination of the particular phase of a known subacute or chronic hepatitis; indications for therapy not obtainable from complete clinical and laboratory examination; and accurate evaluation of therapeutic regimes in certain types of chronic hepatic disease.

Needle aspiration liver biopsy has proved a useful and safe measure for making exact diagnoses and for

studying the abnormal physiology of liver disease.

(Volwiler, Wade, and Jones, C. W.: New England J. Med., 237, 651-656, October 1947. The authors are connected with Harvard Medical School and the Massachusetts General Hospital, Boston.)

The Management of Jaundiced Patients

By A. M. SNELL

(Abstracted from the Journal of the American Medical Association, Vol. 133, 19th April, 1947, p. 1175)

While many excellent classifications of jaundice have been advanced one which represents an over-simplification of the problem is best suited as an approach to the subject of therapeutics. It is that of McNee, who regarded jaundice as hæmolytic hepatocellular or obstructive. The hemolytic varieties may be recognized by appropriate studies of the blood and of the products of breakdown of hæmoglobin. Evidence of serious hepatic dysfunction is usually absent.

A great many diagnostic short cuts have been suggested for the differentiation of obstructive and hepatocellular jaundice most of which are based on the previously mentioned fact that gross disturbances of hepatic function occur early in the course of primary the extrahepatic biliary passages. The hepatic functional tests commonly used in this differentiation appear in the accompanying table.

Results of hepatic functional tests in obstructive jaundice and in hepatocellular jaundice

TYPE OF JAUNDICE

Test

Obstructive Hepatocellular

Plasma cholesterol Alkaline phosphatase Serum protein

Thymol turbidity

Elevated Increased Normal. Normal

Normal or low. Reduced:

Negative

reversed albuminglobulin ratio. Positive.

Thymol turbidity ... Negative Cephalin-cholesterol floc- Negative culation test. Excretion of hippuric acid Normal Effect of vitamin K on Prompt prothrombin time.

Decreased. Delayed or absent.

Positive.

They are not intended to substitute for clinical judgment but their use definitely extends the range of diagnostic accuracy in the doubtful case; as a supplement to careful clinical study they leave little margin for error.

SURGICAL INDICATIONS

Comments on surgical indications by one whose primary interest lies in the field of medicine may at first glance seem impertinent. These are offered only as opinions which may well be challenged. Surgeons have at times been swayed by Moynihan's dictum of an earlier epoch that 'no man living is infallible in the diagnosis of jaundice'.

The following circumstances in connection with the presence of jaundice are considered to warrant surgical

exploration of the biliary passages.

(1) A reliable past history of gallstones or colic or both.—The fact that the biliary passages have once been shown to contain stones is of the greatest significance. The patient whose former cholecystogram has shown multiple stones has a 13 to 20 per cent chance of having calculi in the duct also; with simple cholesterol stones or a roentgenologic diagnosis of a non-functioning gallbladder the probability of stones in the duct is considerably less. One should always recall that in spite of many warnings by surgical authorities the common bile duct is not explored as thoroughly or as often as it should be. Even if the ducts are free of calculi, inflammation or ædema involving the gallbladder, ducts or pancreas may produce temporary jaundice in patients who have calculous cholecystitis.

Hence, a previously positive cholecystogram or a history of removal of a stone-filled gallbladder may be

of great value in arriving at a decision.

It should be emphasized that jaundice due to stone may not be associated with colic; it may be unusual in its chronologic relation to the appearance of jaundice; pain, too, may be absent or atypical in character and location. If the gallbladder has previously been removed the onset of icterus is more frequently associated with typical colicky seizures.

(2) Proved intermittent biliary obstructions with

(2) Proved intermittent biliary obstructions with fever.—Exploration in cases of proved intermittent biliary obstruction with fever is aimed primarily at the silent ball-valve stone, the symptomatology of which was so well described by Osler. The rare benign tumours of bile ducts may produce a similar clinical syndrome; the same may be said of the equally uncommon primary stricture of the duct and of the more frequently encountered late post-operative stricture with incomplete obstruction of the duct. more frequently encountered late post-operative stricture with incomplete obstruction of the duct. Chronic relapsing pancreatitis is another diagnostic stumbling block. The greatest danger lies in the fact that patients who have chronic hepatitis, hepatic atrophy or cholangitis also may have intermittent icterus and fever. So far as possible, primary hepatic disease should, therefore, be excluded. If the liver is large, a needle biopsy may be a worth while preliminary procedure. procedure.

An associated biliary fistula with or without acholic stools.

(4) Painless jaundice appearing within six months after cholecystectomy.—As is generally known, in the majority of cases in which painless jaundice appears within sixty days after cholecystectomy, it is due to traumatic stricture or even to accidental section of the common bile duct at operative intervention. Care must be taken to exclude homologous serum jaundice with its long incubation period of sixty to one hundred and twenty days. A negative Hanger test or the absence of thymol turbidity should give the surgeon

assurance on this latter point.

(5) Proved complete and permanent biliary obstruction.—The completeness of mechanical blockage of the bile duct due to carcinoma of the pancreas, papilla or common duct has been repeatedly emphasized. It is in this type of case that radical resection of the obstructing lesion has been performed with such gratifying

results.

RELATIVE CONTRA-INDICATIONS TO SURGICAL TREATMENT OF JAUNDICED PATIENTS

(1) A recent history of exposure to hepatotoxic agents.—A routine inquiry in regard to a recent exposure to hepatotoxic agents should be made in all cases of jaundice. In these times the diagnostic possibility of epidemic infective hepatitis must also be considered.

(2) Transfusions or plasma infusions sixty to one hundred days previously.—The danger of confusing homologous serum jaundice due to transfusions or plasma infusions sixty to one hundred days previously with that due to other causes cannot be over-

emphasized.

(3) Vascular 'spiders', visible collateral circulation.— Pulsating angiomas which appear in the distribution of the superior vena cava are almost the trade mark of primary hepatic disease. They occur but seldom in patients with stricture. Visible distention of the abdominal veins has a similar significance, as it indicates interference with party black. interference with portal blood flow.

(4) Fetor hepaticus.—The peculiar odour of the breath associated with hepatic insufficiency has been described as sweetish, mousy or resembling the odour of certain aromatic amines. It is especially likely to occur in the later stages of hepatic atrophy or cirrhosis

and can never be safely disregarded.

(5) Œdema or pronounced hypoproteinæmia or both.—These findings are rare in cases of obstructive jaundice and the presence of ædema or pronounced hypoproteinæmia or both should always serve as a warning to the surgeon who is considering exploration.

(6) Extrahepatic tumour masses.—Masses in the right upper quadrant of the abdomen projecting from the inferior surface of the liver may be due to primary carcinoma of the galibladder or they may be due to malignant lesions of the stomach or splenic flexure, with

or without hepatic metastasis.

(7) Decidedly chronic jaundice with splenomegaly -Patients presenting the syndrome of decidedly chronic jaundice with splenomegaly are usually suffering from what has been described as hypertrophic or pericholangiotic biliary cirrhosis. A few may present associated lipemia and zanthomas. Many show little evidence of interference with hepatic function even after long and the state of the state periods. As a group, these patients are seldom benefited

by any surgical procedure.

(8) Intense jaundice with patent biliary passages.—
Patients whose bilirubin levels are in excess of 25 mg. per hundred cubic centimetres of serum are most frequently afflicted with primary hepatic disease (infecquently afficted with primary hepatic disease (infectious hepatitis atrophy or cirrhosis), primary carcinoma of the liver or extensive necrosis of the hepatic parenchyma secondary to biliary obstruction. Even when there is a good reason to believe that the biliary passages may have been previously occluded, the surgeon should proceed with great caution and consider the results of hepatic functional studies with unusual care. care.

(9) Evidence of active hæmolysis.

(10) Greatly reduced cholesterol esters or failure of hippuric acid synthesis.—A low or falling blood cholesterol level and a diminution of the cholesterol esters to less than 50 mg, per hundred cubic centimetres of plasma are indicative of severe parenchymal hepatic injury. Hippuric acid excretion of less than 50 per cent of normal has a similar significance and indicates an

increased surgical risk.

(11) Hypoprothrombinamia refractory to vitamin K.—No matter how complete or prolonged mechanical obstruction to the biliary passages may be, the prothrombin deficit which results is almost invariably responsive to the oral or parenteral administration of vitamin K. In primary hepatic disease the prothrombin vitamin K. In primary nepatic disease the protiromain deficit may not be as great, but it is usually completely refractory to treatment. The effects of vitamin K therapy may, therefore, be of diagnostic value and are at times sufficient to establish the diagnosis of primary hepatocellular injury, as has been mentioned in the table.

DIETETIC AND OTHER TREATMENT OF JAUNDICED PATIENTS

The treatment of patients who have obstructive jaundice.—Management of patients with obstructive jaundice must be highly individualized. Many patients who show minimal disturbance of hepatic function who show minimal disturbance of hepatic function require little or no special care, while others who have been jaundiced for a long period may have sustained serious hepatic injury, which will tax one's therapeutic resources. The diet should contain at least 350 gm. of carbohydrate and 150 gm. of protein daily; the intake of fat may be liberalized if it is tolerated by the patient. It is rather unusual to find a patient who cannot take at least 100 gm. of a fat a day. Dextrose need not be given intravenously except when the need not be given intravenously except when the patient is vomiting or unable to eat. The advisability of its use during the immediate pre-operative and postoperative period is, however, well established. intravenous use of protein hydrolysates is believed to be unnecessary except when the patient is mal-nourished. Transfusions need be used only as necessary to maintain a normal level of hæmoglobin. Vitamin K should be given intravenously in dextrose solutions just before operative intervention or orally, together with bile salts to insure its absorption, for a few days

before the operation, and its administration should be continued during the post-operative period to compensate for the fall in prothrombin which usually occurs. Other vitamin therapy should be given only on the basis of specific indications. Post-operative care should include fluid administered parenterally (chiefly in the form of dextrose solutions) in sufficient quantities to maintain a positive fluid

balance and a normal output of urine.

balance and a normal output of urine.

Treatment in the primary hepatocellular forms of jaundice.—The management of the primary hepatocellular forms of jaundice is now directed chiefly at the maintenance of an optimal nutritional state, with specific treatment for such deficiencies of vitamins and protein as may occur. The diet should contain 350 to 500 gm. of carbohydrate, 100 to 150 gm. of protein and 100 to 150 gm. of fat. It is the usual practice to plan the diet with the idea of deriving a considerable portion of fat and protein from vegetable sources, eggs, dairy products, beef and liver. The diet may be liberalized considerably to suit the tastes of the person liberalized considerably to suit the tastes of the person considered. The major problem is not to prescribe a diet of particular composition but to insure the inges-tion of a maximal amount of nutritious food. Since many of these patients have no desire to eat and even a profound disinclination to do so, the task of feeding them is a difficult one. The diet should be measured, if necessary, and the caloric intake charted. Supplementary infusions of dextrose and protein hydrolysates are often necessary to bring up the caloric intake and to maintain fluid balance. A normal level for hæmoglobin should be insured by frequent transfusions of blood.

There is increasing evidence to indicate that one of the principal features of hepatic insufficiency is a failure to metabolize ingested protein. Many patients who have primary hepatic disease have, as is generally

known, significant reductions in the serum albumin with or without a compensatory rise in globulin. Not a few have albumin levels of less than 3.5 gm. per hundred cubic centimetres of serum, a point at which ascites and cedema will usually occur. The hypoproteinemia in these cases should be vigorously treated and it has often been noted that clinical improvement will run parallel to a rising serum albumin level. The amount of plasma and serum albumin required to affect serum protein levels is large. The necessary dose of plasma is usually 500 to 750 c.c. two or three times a week, until a normal blood protein level is reached and 250 to 500 c.c. weekly thereafter to serve as a maintenance dose. Serum albumin should be given in initial doses of 50 to 100 gm. daily, until the serum proteins reach a safe level. A maintenance dose of 25 to 50 gm. every few days thereafter will usually suffice.

Recent studies at the Rockefeller Institute indicate that the use of extract of liver may enhance the beneficial effects of infused protein. The Rockefeller beneficial effects of infused protein. The Rockfeller workers, using a special preparation of liver designed for intravenous use, have, by gradually increasing the amounts injected, brought the dosage up to 10 c.c. two or three times a week. The material is given diluted with isotonic solution of sodium chloride and does not often produce any reaction, even if its administration is continued over fairly long periods. Crude liver extracts also have had a beneficial effect, but their use is more likely to be attended by reactions than is that of the purified extract

is that of the purified extract.

The use of such lipotropic substances as choline and methionine is now in the investigative stage, and there is some rather inconclusive evidence to indicate that they may be of therapeutic value. In a recently reported series of cases of injectious hepatitis the use of these substances did not shorten the course of the disease, and a personal experience of mine with patients who had homologous serum jaundice appeared to be in line with these results. However, as Beams has claimed, there is a reasonable basis for the use of these substances if the patient has a large and presumably fatty liver.

It is now the usual practice to supplement the treat-It is now the usual practice to supplement the treatment with liberal quantities of vitamins. Some source of the vitamin B complex seems to be an essential part of treatment. If powdered brewers' yeast can be tolerated it may be given in doses up to 30 gm. three times daily, diluted in tomato juice. Many patients object to its taste and it is necessary to depend on the various proprietary preparations of the B complex in concentrated form. Thiamine chloride and nicotinic acid should be given in liberal amounts to patients who are receiving large quantities of dextrose intrawho are receiving large quantities of dextrose intra-venously. These portions of the B complex enter into the composition of enzyme systems essential to the metabolism of carbohydrate and may readily be exhausted if many vitamin-free calories are given. Thiamine and nicotinic acid also apparently have a place in the treatment of hepatic coma, and the encephalopathic states, although they do not by any means constitute specific remedies for these conditions. means constitute specific remedies for these conditions.

Ascorbic acid requirements may be met by the liberal use of orange juice which increases the palatability of the diet. Vitamin D and extra calcium salts may be added to the diet of patients who show evidence of osteoporosis. Vitamin K is apparently not utilized in the presence of primary injury of the hepatic cells although large doses may have some effect in keeping the blood prothrombin above a critical level.

A final word may be said in report to the treatment

A final word may be said in regard to the treatment of hepatic insufficiency. It is far easier to prevent than to treat and, once it appears, there seem to be no specific remedies available other than those described previously. These should be pushed vigorously in the hope of maintaining the best possible nutritional state for the patient and allowing time for some regeneration of hepatic tissue. Anoxemia, which may be a feature in some cases of hepatic failure, appears to depend oglobia. The only means of treatm e to supply normal hæmoglobin by and to administer

oxygen by appropriate means. Recent studies on cytochrome C. indicate that this substance is capable of correcting anoxemia under certain conditions, and its use in hepatic disease will, no doubt, be investigated further.

Whatever success has been attained in the treatment of acute and chronic primary hepatic disease has been achieved by following in detail the programme described in previous paragraphs. Patience, persistence and attention to every demonstrable abnormality of metabolism are necessary. The results in such hitherto hopeless conditions as portal cirrhosis have been highly encouraging and not a little of the improvement in surgical results may be due to the application of these principles.

The Rh Factor and Repeated Miscarriages

By P. M. DE BURGH et al.

(Abstracted from the Medical Journal of Australia, Vol. 1, 22nd February, 1947, p. 239)

The percentage of Rh-negative persons among the 97 patients examined (23.2 ± 2.92 per cent) is in striking contrast to the percentage of Rh-negative individuals who gave birth to infants affected with hæmolytic disease of the newborn (92 per cent). It is clear, therefore, that an Rh incompatibility is not one of the major causes of repeated miscarriages. Although the number of cases investigated in this series is not large, it is hoped that the results, when added to those of other series, may assist in determining whether such an incompatibility plays a minor ætiological rôle.

Two patients not included in the series have been encountered in whom iso-immunization was detected. One of these would have been included in the second group and the other in the third group. The Rh factor has been demonstrated in an eleven-weeks fœtus, and the detection of iso-immunization in the serum of patients who have had repeated miscarriages is therefore not surprising. However, little evidence is available at the present time to support or contradict the hypothesis that an Rh incompatibility causes miscarriages. Rh incompatibility could certainly not be considered the ætiological factor in a particular instance unless evidence was obtained of maternal iso-immunization.

The Incidence of Tuberculous Infection in Male Medical Students in Melbourne

By T. E. LOWE

and

K. H. HALLAM

(Abstracted from the Medical Journal of Australia, Vol. 1, 21st June, 1947, p. 749)

The results obtained in this survey indicate that there is no difference in the incidence of tuberculin sensitivity between medical students in their preclinical period and the general university population of the same age. However, there is a considerable increase in the proportion of tuberculin-sensitive students during the clinical period of the medical student's course.

the clinical period of the medical student's course. These findings indicate that the medical student during his hospital years is exposed to the risk of tuberculous infection to a much greater degree than the general population. The exposure presumably comes from contact with patients suffering from pulmonary tuberculosis. As most of the known cases of pulmonary tuberculosis are transferred from the general hospitals to special tuberculosis institutions, it would seem likely that much of the students' exposure comes from unrecognized cases. That there are many unrecognized cases of pulmonary tuberculosis in the community and therefore amongst hospital patients, is clearly shown by the results of routine chest radiography of apparently healthy recruits to the armed services, by which an incidence of 0.56 per cent was discovered.

It is well recognized that the risk of developing pulmonary tuberculosis (active disease in contrast to tuberculous infection as shown by skin sensitivity tests) is greatest in individuals who are not tuberculin sensitive. In some instances institutions have excluded from duties in contact with known sufferers from tuberculosis, members of the staff who are not sensitive to skin tests with tuberculin. As it is manifestly impracticable to require a medical student to give a positive response to the Mantoux test before starting his clinical work, every effort must be made to reduce his exposure to a level similar to that experienced by the general population. This in reality implies discovery of the unsuspected cases, and hence it requires that a radiograph should be taken of the lungs of all patients (in-patient or out-patient) attending the

It is felt that no useful purpose would be served by speculating on the cause of the areas of calcification scen in the lung films in this series. They are apparently unrelated to tuberculous infection; but we have no data from the survey to give any clue to their origin.

Reviews

MEDICAL CASES DESCRIBED FOR NURSES: AN INTRODUCTION TO CLINICAL MEDICINE FOR NURSES.—By S. Locket, M.B., B.S. (Lond.), M.R.C.P. (Lond.). 1948. E. and S. Livingstone Limited, Edinburgh. Pp. 88. Illustrated. Price, Bound 6s. Paper cover 4s. Postage 3d. (home)

An excellent manual which should enable the student nurses to learn and to understand the conditions and diseases she may meet in the wards. The treatments and tests done in the wards and laboratories of the modern hospital can be made realistic and more interesting to the student nurse if they are linked up with the teaching as in this useful book.

The prologue and epilogue of the book are apt and the student who takes them to her heart will do well.

ANATOMY AND PHYSIOLOGY AND THE CAUSES OF DISEASE.—By J. P. Mitchell, C.B.E., M.D. Second Edition. 1948. Ballière, Tindall and Cox, London. Pp. xvi plus 226. Illustrated. Price, 5s.

A simple textbook of Anatomy and Physiology useful as a textbook for assistant nurses or junior nurses or for those student nurses whose knowledge of English is not great, as the author explains. Though it is debatable as to whether a standard textbook would not be as easy to understand if lectures were being given on these subjects to the student nurse.

Professor O'Donel Browne, M.B., M.A.O., M.A., Litt.D., F.R.C.P.I., F.R.C.O.G. Second Edition. 1948. John Wright and Sons Limited, Bristol. Pp. viii plus 267, with 8 plates and 218 illustrations. Price, 35s.

This is a very handy book on practical obstetrics, meant for students preparing for qualifying examinations. There are 38 chapters dealing with all common conditions of obstetrics. Everything has been dealt with in detail. Some illustrations are of value, others are there, because it is the fashion to put them there. A bottle with laminaria tents is depicted side by side with a contrivance to sterilize them. One fails to appreciate the value of such illustrations in a practical handbook for students and examinees. The printing and the paper are both excellent.

In the preface the author says the book is primarily intended 'for my students'. If it is not meant for

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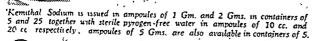
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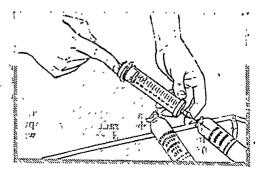
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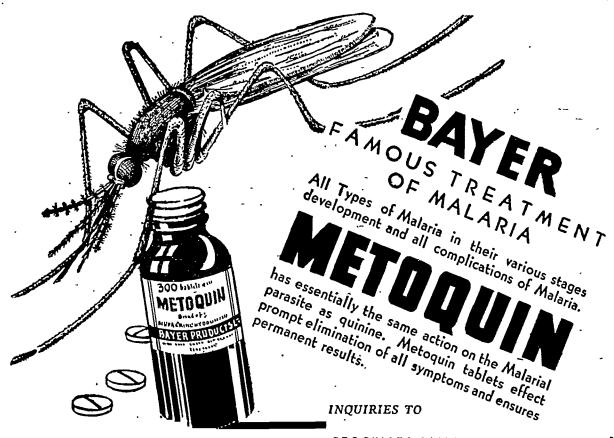
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other students no further comment need be made about the merits or demerits of this book. But as such a book with so many excellent features is likely to fall in the hands of other students certain comments

are necessary.

The language is not always real English. While describing the operation of internal version—it is written 'Cervix must be large enough to admit the whole hand'—cervical canal is meant. 'Sufficient liquor whole hand '—cervical canal is meant. 'Sufficient liquor to allow the child to turn'—child to be turned is meant. On page 102, last line, 'Glove is stained by meconium'. Correct English should have been stained with meconium.

Douching the vagina and the uterine cavity has been advocated. Modern obstetrics does not support douching the uterine cavity where there is intrauterine sepsis, as has been recommended by the author on page 192. The author admits that hydrocephalic page 192. The author admits that hydrocephane children are short-lived and imbeciles, yet he justifies a Casarean section or an internal version for the delivery of such a child. This, of course, is the teaching of a surgeon professing the Roman Catholic Faith and should not be a subject of scientific or clinical discussion.

discussion.

On page 132, the author says that in early unauptured ectopic tubal gestation 'the blood comes from the tubes, where it has excited peristalsis', etc. We do not agree with him. The interstitial part of the tube is very narrow and is telescoped into the corner of the uterus. The peristalsis described by the author is likely to cause spasm of the overlying circular muscle fibres at the uterine corner and blood will be unable to get into the uterine cavity. We think the blood is of endometrial origin.

of endometrial origin.

The author says 'there is a tendency to excessive bleeding in a carneous mole'. We think just the opposite. The uterine sinuses are thrombosed. If the uterine cavity is not curetted, there is no bleeding at all. The above are some of the many irregular observations recorded in this book. It cannot have a demand from students in general unless suitable corrections are made.

M. N. S.

PRINCIPLES AND PRACTICE OF OBSTETRICS,-By Joseph B. De Lee, M.D., and J. P. Greenhill, M.D. Ninth Edition. 1947. W. B. Saunders Company, Philadelphia and London. Pp. vii plus 1011, with 1,108 illustrations on 860 figures, 211 in colour.

When we met Professor Greenhill in Dublin last year, he said he was going to bring out a new edition of this book with 'specially interesting features'. This he has done. It fact Professor Greenhill has so altered the book that its original features are barely recognizable. The text has been arranged in two columns and a new type of printing and binding has been introduced. The text-matter has been altered giving introduced. The text-matter has been attered giving the reader an exhaustive account of all that is modern in obstetrics. When one read the former editions of this book one was learning what Professor De Lee taught and practised, the present edition has lost that personal factor. One considers this to be a change for the better from a textbook point of view. Such a change is inevitable on account of the vast advances in the science and art of obstetrics. the science and art of obstetrics.

The illustrations have always been the special feature of this book. Some new illustrations have been added. The author in the preface mentions Ansen and Custis's pictures of the dissections of the pelvis. We appreciate many others, among them the cuttings from the

motion picture reels.

some new chapters have been added. Among them worth mentioning are the following:—'Fætal erythroblastosis', 'Care of premature babies', 'Circum vision'. Some chapters have been completely rewritten, e.g., 'Physiology of the fectus', 'Ante-partum care' and 'Post-partum care'. All these have been excellently written. We do not however accept all the lines of treatment recommended. We have disappointing results. treatment recommended. We have disappointing results

from the use of magnesium sulphate in eclampsia. We do not use hydrostatic bags in placenta prævia at all, nor do we teach our students to deliver the after-coming head in breach presentation by application of traction with finger or fingers in the mouth. We mention these only to show that a book, however exhaustively written, cannot be a perfect one.

This edition of the book will continue to be what it has been called, viz, 'the obstetrician's bible'. A very pleasant readable style, the new arrangement of the text and the excellent illustrations will undoubtedly

attract a host of readers and admirers.

M. N. S.

DISEASES OF THE EYE .-- By Sir John Herbert Parsons and Sir Stewart Duke-Elder. Eleventh Edition. 1948. J. and A. Churchill Limited, London. Pp. 732 and vill with 21 plates and 368 text-figures. Price, 30s.

This book was first published forty-one years ago and is perhaps better known than any other textbook ' of ophthalmology; indeed, it is probably the best of its kind in ophthalmic literature. It is designed for students, general practitioners and junior, ophthalmic surgeons and contains all the essentials of ophthal-mology in its clinical practice. The present edition has been revised and the new therapeutic treatment with the sulphonamide group of drugs and penicillin has been added. The well-tried classical methods of treatment remain essential and are therefore included. The ophthalmological aspects of toxo-plasmosis and brucellosis have been added. The illusplasmosis and brucellosis have been added. The illustrations, printing and general set-up are still of the highest quality and the book will be read with pleasure and advantage for many years to come.

E. J. S.

THE ANATOMY OF THE EYE AND ORBIT.—By Eugene Wolff, M.B., B.S. (Lond.), F.R.C.S. (Eng.). Third Edition. 1948. H. K. Lewis and Company, Limited, London. Pp. 440 with 323 illustrations including 24 in colour. Price, 45s.

THE third edition of this Anatomy of the Eye and Orbit has been somewhat enlarged and about eighty more illustrations have been added. The main changes in the text are in the descriptions of the ciliary muscle, the substantia propria of the cornea, the vitreous, the zonule of Zinn, the distribution of the lachrymal fluid, the muco-cutaneous junction at the lid margin, the precorneal film, the retinal capillaries and the central connections of the visual apparatus.

This is a superb book from every aspect. The descriptions are clear and easy to understand, while the illustrations are the best to be seen in current ophthalmic literature. Indeed, many authors now borrow Mr. Wolfi's plates for illustrating their own works and some of them have been used in the new editions of Parsons' Diseases of the Eye and in Duke-

Elder's Textbook of Ophthalmology, Vol. I.
The paper and printing are excellent and the price seems very reasonable for this delightful work. Of its

kind there is nothing better.

E. J. S.

THE OCULOROTARY MUSCLES.—By R. G. Scobee, B.A., M.D. 1947. Henry Kimpton, London. Pp. 359, with 113 figures and illustrations. Price, 40s.

AFTER describing the anatomy and physiology of the extra-ocular muscles and their central connections, the author discusses latent and manifest deviations and the exact diagnosis of squint. A final section describes the treatment of deviations. No details of orthoptic treatment are given and surgery of squint only receives thirteen pages with no illustrations. There are many quotations from other authors which rather hinder than clarify explanations.

HANDBOOK OF OCULAR THERAPEUTICS .--- By the late Sanford R. Gifford, M.D., F.A.C.S., Revised by Derrick Vail, M.D., D.O. (Oxon.), F.A.C.S. Fourth Edition. 1947. Henry Kimpton, London. Pp. 336, with 66 illustrations. Price, 25s.

This well-known book has been brought up to date by Professor Vail of Northwestern University Medical School, Chicago, and it well maintains its former standard.

The first half of the book discusses the pharma-cology and the use of the drugs and the actions of the various types of physical therapy employed in

ophthalmic practice.

The second half of the book discusses diseases of the eye and its adnexa in relation to their treatment. Much useful information is to be found and the book is thoroughly recommended to ophthalmic surgeons.

E. J. S.

Correspondence

ANTI-TUBERCULOSIS MEASURES BY SOUTH AFRICAN INDIANS

Sir,—This, briefly, is the story of a real community

health service amongst South African Indians.

Tuberculosis is Public Health Enemy No. 1 amongst the non-white peoples of South Africa. The death rate for Indian people is five times that of the European while for Africans it has risen, in urban areas, to 746 per 100,000, One of the main reasons is the low economics they are unrepresented in the proteins. all practical purposes they are unrepresented in Central, Provincial and local government and therefore cannot effectively press home their claims for

even a fair share of the limited services available.

Six years ago now two Indians, two Europeans and an African met together and decided to seek out and help families in which there was a focus of TB, wherever they could find them, the main idea being to prevent the spread of the disease in the home. Such was the spirit of service called forth that the work had to be organized until to-day there are thirty-three TB area Care Committees throughout Natal with an enrolment of over 700 members. They are called 'The Friends of the Sick Association'.

Organization.—The only requirement for membership is the undertaking to care for a TB contact family, there is no subscription. The would-be Friend serves a probationary period for three months before applying for membership, this must be unanimously supported by the Care Committee, he must also attend a weekend training course on the work. Further, three weeks before the annual meeting, every Friend is sent a renewal membership form; if this is not returned by the date of the meeting, the name is automatically expunged from the Membership roll. In this way real live membership is assured.

The Working Committee is the nerve centre consist-

ing of seven elected members and two representatives

from each Care Committee.

There is also a Grants Committee, Magazine Com-

mittee. Fund Raising Control Committee.

Methods.—In South Africa TB is a notifiable disease. All notifications, names and addresses are sent by the health authorities to the central office where the secretary, a full time voluntary worker of poor family. divides them up according to area and sends them to the Care Committee. At the weekly meeting of the Care Committee, an individual friend is given charge of each case. The friend visits the home, often not mentioning TB to begin with and gains the confidence mentioning the confidence with and gains the confidence and the family and sufferent He them: (1) advises the of the family and sufferer. He then: (1) advises the family on how to prevent the spread of the disease

in the home. The presence of the sufferer, due to lack of bed accommodation, adds to the difficulty of this task.

(2) Sees to it that all contacts go to the clinics for examination. Last year the F.O.S.A. sent over 3,400

contacts and suspects.

(3) If there is need, makes a cost of living survey in the family and a sesses the need in cash. This comes forward as a recommendation from the Care Committee for a monthly grant or emergency grant, to the Grants meeting. Money for these grants to be met is raised by the Care Committees in their areas, mostly from working people who voluntarily tax themselves anything from six pence to five shillings per month for as long as they are in employment. These people never refuse to give what they can. This money all comes into the central grants meeting and is redistributed according to the TB need in the areas. Each month every penny is paid out. At the Working Committee the treasurer shows that there is no more money in the bank. These young people who have made the vital contact in the home, know the fear and the need, never let thee sick friends of theirs down by failing to collect money. In this way the community is continually faced with its own need. In this way over £300 monthly is paid out through the individual friends, putting good food into the contacts so as to raise their resistance to the disease.

Nutrition and housing or rather their lack are the two main secondary causes in the spread of the disease. The F.O.S.A. felt after a time that it must tackle both these or much of its effort would be wasted.

So five years ago an Indian Land Company approached for 25 acres of land and a few members went on to this land and started, often with voluntary labour, to level sites and to build houses.

To-day there is almost a complete little village and it is called Fosa, Twenty cottages have been built for widows and children where the wage-earner has died from TB. Each cottage costs about £250 and is named after the donor, usually a Care Committee, which raises this money specifically by holding drama shows, concerts or boxing matches.

The widows play a very useful part in the life of the place by doing all the cooking, mending, washing and ironing and cleaning for which they receive a cash wage. Their children go to school. The problem of cleanliness and house pride was solved by instituting a 'Better Homes Competition'. Each family is marked for corners windows floors layratory kitchen, bathfor corners, windows, floors, lavatory, kitchen, bathroom, bedding and personal appearance and on Sunday the winning family is given the wherewithal with which to give a tea-party in their nice clean house to all the other families on the settlement.

A thirty-six bed children's hospital, part of a seventy-two bed block, has been built with funds given by the students of the Natal University from their University 'Rag' Funds. Here children with primary tubercle and surgical TB cases are treated.

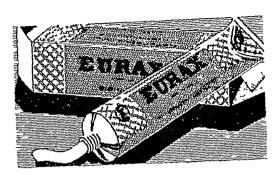
In order to make some contribution to the appalling shortage of beds, nine double rondayel wards, each taking four patients, have been built for adult cases with a negative sputum. Here they sleep out of doors all the year round, get the best food possible and are put on to graduated work, a close watch being kept on eweight and temperature, until, in medical opinion, they can return to normal life and work.

At Fosa there is a community store, a school with 60 child pupils, a Government Health Centre, a poultry farm as a sheltered employment project, and a House of Quiet, where people of differing beliefs can and do go for meditation and prayer. There is also a part of the settlement financed by the Christmas Stamp Fund.

There are five Indian and five European full-time workers who receive their keep and 45 per month. The medical officers of the government regional TB hosnital nearby do all the examinations and every one on Fosa has a periodical chest check-up once every three months. In all there are 160 people now at Fosa. It costs £6,000 p.a. to run and has about £24,000 worth of capital improvements on it.

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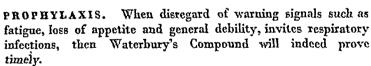
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All this has taken place in a short space of time and because of the goodwill of many people, rich and poor, old and young, black and white, Muslim, Hindu and Christian.

Surely if this community, so grievously sundered by economic, religious and colour strife can achieve this then it is possible in any community, why not in

vours?

Yours, etc., P. C. SYKES.

FRIENDS OF THE SICK ASSOCIATION, THE STONE HOUSE, WESTMANCOTE, TEWKESBURY, GLASGOW.

A NEW OPERATION FOR ENTROPION AND TRICHIASIS OF THE UPPER EYELIDS

Sir,—Anent the article under the caption given above published in the Gazette of February 1948 may I, without meaning to cast any reflection on the author, say that the operation is known as the Macheksay that the operation is known as the known as the known Blaskovics' operation described fully in Torok and Grout's Surgery of the Eye, an operation designed and eminently suited for the extreme degree of entropion found in the late stages of trachoma. With due deference to the author I may state that æsthetics due deference to the author I may state that asthetics play little or no part in the gross deformity found in these cases, a feature not brought out in the otherwise very excellent diagrams of the author. I performed quite a number of the operations when I was Honorary Ophthalmic Surgeon, Government Hospital, Madura (1930-34), with very satisfactory results in cases of total entropion and trichnasis of the upper lid. The operation of Machek-Blaskovics is much simpler in that only tree incisions possible to each simpler in that only two incisions parallel to each other and to the lid margin are required and the lower one is a couple of millimetres longer at either end. The lid margin is then split at Arlt's line and burrowed up to the lower incision. The pedunculated flap is then pulled down through the burrow into the gap at Arit's line with fine fixation forceps and smoothed down in it. The elasticity of the subcutaneous areolar tissue of the lid keeps it in accurate apposition once it has been spread out evenly and does not require any sutures to hold it in position. The width of the flap is 2 mm. and the length that of the entire lid margin. The wound in the lid is sewn up with a few interrupted sutures. I have used hair from the head of the patient or a nurse for this and other kind of plactic surrors of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the free of the head of the patient of the pati plastic surgery of the face, after boiling it along with the instruments. It is much finer, more pliable and less irritant than all made suture materials. Apropos of irritation of suture I may also be allowed to say that the less scrubbing and antisepsis there is done in that the less scrubbing and antisepsis there is done in plastic surgery of this region the more satisfactory the result thereof. I believe this is a well-known axiom in this kind of surgery. Lastly, the pedicle of the graft in the operation I have cited lying under the strip of skin between the lid margin and the incision consists entirely of connective tissue whereas in the author's operation there is skin also, not a very desirable feature. feature.

C. V. KRISHNASWAMI,

MAJOR, ex-1.M.s.

Chief Surgeon and Chief Medical

Officer.

P.S.—Human hair has served me very well for suturing after dacryocystectomy and operations round the mouth.

[The operation described by Mascati (I.M.G., LXXXIII, 2, 1948) differs from the Machek-Blaskovics' operation in several respects. From the diagrams, it appears that the incision only involves the middle third of the skin of the upper lid, whereas in the latter operation, it extends the whole length of the lid. In Mascati's operation, a flap of skin is turned downwards while in the Blaskovics' technique a strip of skin still

attached at either end is slid down to the tarsal groove. The principle is the same in each operation. Both operations suffer from the same defect that they do not correct the tarsal deformity and hypertrophy. They may obviate the symptoms of entropion-trichiasis just as does a successful van Milligan operation, in that they prevent the lashes from rubbing on the cornea.

It seems that as the main defect in entropion-trichiasis (which is usually due to trachoma in this country) is in the tarsal plate, it is this hypertrophy and deformity of the tarsal plate that should be directly corrected at operation. This can be done very successfully by the Hotz-Anagnostakis' operation in which a gutter is excised from the middle of the tarsal plate for its whole length. The reformed tarsal plate is no longer hypertrophied and is restored to its original shape. An important practical point is to leave the stitches long and strap them to the forehead with adhesive strapping so as to get slight over-correction for a few days.—E. J. S.I

ACUTE PALUDRINE POISONING

Sin,—A man, out of sheer fun, swallowed at a time 12 tablets of paludrine hydrochloride (1,200 mg.), and was brought to my office 6 hours after with severe toxic symptoms. The history was as follows:—

A few minutes after he swallowed the drug, burning in the pit of the stomach accompanied with giddiness ensued. Tremendous projectile vomiting commenced three hours later coupled with excessive pain in the abdomen and extreme weakness all over the limbs. His temperature was sub-normal (96°F.) and his pulse slow and thready.

Resuscitation was effected without any accountable aftermath by a course of gastric lavage and stimulants.

CAPTAIN A. K. CHAKRABARTI, Anti-Malaria Officer in-charge, Tarai Colonization Scheme, Kichha, District Naini Tal.

[The usual daily therapeutic dose is 0.3 to 0.6 gm. Gastric irritation after a single heavy dose (1.2 gm.) is not surprising.—R. N. C.]

Any Questions

[These questions are answered, as a rule, by letter, in the first instance. Later, they are published with their answers in this section for general information.]

'ROBUDEN' IN THE TREATMENT OF PEPTIC ULCER

I shall consider it a great favour if you let me know through your journal more about 'Robuden', particularly about its chemistry and where and how to get it.

A. L. DAS GUPTA. M.B., B.S.

25, CAMAC STREET, CALCUTTA, 21st August, 1948.

Robuden is an extract from the tissues of stomach and the small intestine. First prepared in Switzerland from freshly slaughtered animals, it has been manufactured and marketed by the Robapharm Laboratories, Basle, Switzerland, under the name of 'Robuden pro U. ventro', 'Robuden pro U. duod' and 'Robuden' tablets.

These extracts are free from lipoids and proteins; the water soluble portion of the extract is put up in

injectable form whereas the water insoluble part is made into tablets; simultaneous administration by oral and parenteral routes is advocated. For treatment of gastric ulcer, a preparation containing predominantly the extract of stomach is used; that for duodenal ulcer treatment contains principally the extract from small

This treatment was introduced on the supposition that normal functions of the stomach and duodenum are maintained by various biologically active substances contained in the tissues, the absence of which favours

ulcer formation.

Favourable results both clinically and experimentally with this treatment have been reported by workers in Switzerland. In simple gastric and duodenal ulcers and in gastritis, beneficial effect is obtained in about 90 per cent of cases; in indurated ulcers, the result of treatment is less favourable.

The supreme merit of this method of treatment is that it does not necessitate confinement in bed, stoppage

of work or restriction of diet.

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576. Ibid., **74**, 1334. Ibid., **75**, 913. Berther, S. (1944) Keiser, D. (1945) HUBACHER, O. (1946) ... Lancet, ii, 272.

-B. M.]

Service Notes

APPOINTMENTS AND TRANSFERS

In exercise of the powers conferred by the second proviso to sub-section (I) of section 7 of the Dentists Act, 1948 (XVI of 1948), the Central Government is pleased to nominate Dr. K. C. K. E. Raja, Officiating Director-General of Health Services, as the President of the Dental Council of India from the date of the first constitution of the Council up to the end of November 1948.

Dr. F. E. Buckler, M.B.D., Assistant to the Surgeon to His Excellency the Governor-General of India, was appointed to officiate as Surgeon to His Excellency the Governor-General of India with effect from the 13th May, 1948, vice Lieutenant-Colonel A. C. Taylor, o.B.E.,

granted leave ex-India pending retirement.
Dr. C. B. D'Silva is appointed to the Medical Research Department on probation for two years, with

effect from the 26th May, 1948.

The services of Dr. V. M. Albuquerque, M.B.E., Additional Deputy Director-General of Health Services (Social Insurance), are placed at the disposal of the Ministry of Labour with effect from the 1st July, 1948.

The undermentioned officer having reached the age for superannuation is permitted to continue on the

active list :-

ARMY IN INDIA RESERVE OF OFFICERS. CATEGORY-8 (Medical)

Captain (Temporary Major) N. G. Patwardhan. Dated 25th February, 1947. The undermentioned officer relegated to Reserve on

release from mobilized service :-

ARMY IN INDIA RESERVE OF OFFICERS. (MEDICAL) Major Bindra Balwant Singh, with effect from 31st March, 1947.

LEAVE

Lieutenant-Colonel A. C. Taylor, O.B.E., Surgeon to His Excellency the Governor-General of India, was granted combined leave ex-India pending retirement for 2 years and 4 months (leave on average pay for

8 months and half-average pay for the balance), with effect from the 13th May, 1948.

INDIAN MEDICAL SERVICE. SECONDED TO THE INDIAN ARMY MEDICAL CORPS

> (Emergency Commission) Captain to be Major

M. M. Changappa. Dated 7th July, 1945.

RELINQUISHMENTS

The undermentioned officer is permitted to relinquish his emergency commission on release from the army service and is granted the honorary rank of Captain:—

INDIAN LAND FORCES. INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Captain Dalil-ur-Rahman. Dated 18th December,

The undermentioned officer is released from army service and is granted the honorary rank of Major:-ARMY IN INDIA RESERVE OF OFFICERS. CATEGORY-8

(MEDICAL) Captain (Temporary Major) N. G. Patwardhan. Dated 2nd January, 1948.

RESIGNATION

The undermentioned officer is permitted to resign his commission :-

ARMY IN INDIA RESERVE OF OFFICERS. CATEGORY-8 (Medical)

Captain Ram Kishan Laroia. Dated 30th June, 1948.

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Original Articles

A LARGE PHEOCHROMOCYTOMA OF THE ADRENAL GLAND

By M. R. SUBBA RAO, M.B., BS. Curator in Pathology

and

T. BHASKARA MENON, M.D., D.SC., FRCP.

Professor of Pathology

Andhra Medical College, Vizagapatam

The incidence of tumours of the adrenal gland is infrequent and pheochromocytomas are the rarest of the medullary group. The latter are mostly adrenal in origin (Berdez, 1892; Manassec. 1893). but extra medullary types may also occur, as paragangliomas (Alezais and Peyron, 1908). The majority of the medullary tumours are being derived either from the undifferentiated sympathogonia or more differentiated sympathicoblasts, pheochrome blasts or pheochromocytes, latter being the adrenaline cells. Most such tumours are accidentally found at autopsy. Of late, a diagnosis of pheochromocytoma has been made during life with increasing frequency, on the basis of attacks of paroxysmal hypertension.

The literature on pheochromocytoma has been reviewed by Rabin (1929), Eisenberg and Wallerstein (1932), Howard and Barker (1937), Brunschwig and Humphreys (1940), MacKeith (1944), Blacklock, Ferguson, Mack Shafar and Symington (1947). The age incidences of these tumours have been tabulated by Blacklock et al. (1947) in a total of 135 cases, including six of their own cases, which they have reported in their review. With the present case making a total of 136 cases the age incidence is as follows:—

10110116 :---

Ages	Males	Females	Not stated	TOTAL
0-10 11-20 21-30	1 4 13	2 7 14	Nil 	. 11 27
31-40 41-50 51-60	11 15 5	18 20 7	••	29 35
61	7	7	·· ··	12 14
	56	75	5	136*

^{*} Includes 5 shown under 'Not stated'.

The above figures show that the incidence is more in women than in men, and is highest in the fourth decade. Brunschwig and Humphreys (1940) reviewing 103 cases found that the tumours were bilateral in 13 cases, that the right side was more frequently involved than the left. The figures of Blacklock et al. (1947) are more comprehensive and as hereunder:—

Right side				64
Left side				39
Both sides	• •		• •	13
Mediastinal	• •		• •	15
Not stated	• •		• •	
		Total		132

Large tumours which could be palpated as masses through the abdominal wall, or which displace the adjacent viscera, have been encountered in very few cases. Kremer (1936) incidentally states that such tumours are very rare. Kremer (1936) has described tumours weighing only between 35 to 75 gm.; Wells and Boman (1937) state that the majority of the tumours were small; Blacklock et al. (1947) in their series of six cases found the largest tumour weighed only 86 gm. Evidently large tumours are rare and seldom give a clue to their presence during life. The tumour that is here described weighed 421 gm. and as such is an unusually large pheochromocytoma.

Case report

Clinical notes.—S. R., a man aged 50, was admitted in the medical wards of the King George Hospital for breathlessness on exertion, and ædema. On examination, there was ædema present all over the body, and a mild degree of ascites. The heart showed left ventricular enlargement, a systolic murmur in the mitral area and an accentuated second sound in the aortic area. The blood pressure was only 150/100. The liver was palpable, but not the spleen. The urine showed the presence of albumen but there was no sugar and no other abnormality. No other investigations were done. A diagnosis of hypertensive cardiac failure was made. Evidently the tumour was not palpable.

The patient died on 30th May, 1947.

The autopsy showed a moderately nourished

man of about 50 years with both pupils moderately dilated, infection of the left conjunctiva, and bleeding from the nose. The teeth and gums were healthy. Œdema of the lower limbs was present, but there was no well-defined general anasarca. The thyroid gland was enlarged moderately, the right lobe being a little larger than the left, but no nodules were felt. The lungs in the thoracic cavity were slightly shrunken; both the bases were adherent to the diaphragm. The right pleural cavity contained a pint of serosanguineous fluid, and the left about ten ounces. The right lung weighed 17 ounces, and the left 18 ounces. There was a slight degree of congestion of both the lungs. The pericardial cavity contained two ounces of serosanguineous fluid. The heart weighed 19 ounces and showed marked hypertrophy and dilatation of the left ventricle; valves and coronary arteries appeared normal. The liver weighed 42 ounces, and was nutmeg in appearance. The spleen weighed 8 ounces and showed congestion. The brain and its membranes were congested. The right kidney weighed 10 ounces,

the capsule stripped off easily, and cut section showed congestion of the cortex and few retention cysts here and there. The right adrenal was normal. The left kidney was in its normal position, the appearances were almost the same as that of the right. Attached to the medial and anterior aspect of the left kidney by a broad fibrous band, there was a tumour of the size of a fætal head. The tumour was of a dark brown colour, irregularly globular in shape with a welldefined thick capsule. The surface of the tumour was smooth with nodules bulging here and there. It weighed 421 gm.; its circumference was 34 cm.; and its diameter ranged between 9.4 and 10.4 cm. The cut surface of the tumour showed areas of congestion and necrosis interposed with yellowish areas, and a well-defined lobulation with fibrous septa containing areas of hæmorrhage, areas of necrosis, and other areas showing dark brownish tissue (figure 1, plate XX).

The tumour was preserved in 10 per cent neutral formol-saline. It was rather unfortunate that it was not possible to estimate the adrenaline in the fresh specimen, as assay of the gland by many workers has revealed a very high content of adrenaline in similar cases. Further examination on the preservative fluid revealed interesting features. The preservative fluid was coloured brown and on adding dilute hydrochloric acid to the fluid, the colour disappeared to re-appear on neutralizing with potassium hydroxide. To a portion of the fluid to which ferric chloride was added, a deep green colour developed suggesting the presence of epinephrine or some closely related compound. Synder and Vick (1947) described these tests for the presence of adrenaline in the fluid.

For histological examination and histochemical tests a number of pieces were taken from different portions of the tumour. Frozen sections were taken to study the chromaffin reaction by the Schmorl technique, and Ogata and Wiesel's technique of staining. Pieces were fixed in Helly's fluid and embedded in paraffin for the usual histological study.

Histologically the tumour comprised groups of cells arranged in an alveolar pattern, the individual cell groups varying in numbers from four to a hundred and fifty cells (figure 2, plate XX). The cells were oval polygonal, or round, with a granular cytoplasm, with a round or oval nucleus, with a well-defined nuclear membrane and a delicate chromatin net-work; well-stained nucleolus was occasionally In areas the cells were closely packed and with little intercellular material so that the cell outlines could hardly be made out. The cell groups were surrounded by fine connective tissue fibrils and with thicker septa in places, as shown with van Geison's technique. The cells varied in size, most of them measuring about 20 \mu : some were larger measuring about 30μ . Some were giant cells with a single nucleus or two or three nuclei. Mitotic

figures and hyperchromatic nuclei were occasionally met with. Scattered in between the cells there were a few cells resembling neuroglia. By Schmorl's technique the cells showed coarse green granules. With Ogata's method of silver staining coarse black granules were visible (figure 3, plate XX). Some of the cells here and there did not show any reaction. With Foot's stain the reticulum was distributed at the periphery, was arranged in an alveolar pattern around groups of cells and had not penetrated in between the cells.

In the connective tissue which surrounded the individual cell groups there were numerous capillaries and blood spaces; some of the spaces contained altered blood and macrophage cells loaded with blood pigment. The blood spaces and vessels did not show any infiltration by the tumour cells. In the tumour mass there were areas of necrosis here and there. The tumour was highly vascular and at certain places showed areas of hæmorrhage. The picture was typical of a cellular pheochromocytoma.

Comment

The blood pressure of 150/100, the only available record in this case, is not in accordance with the usual history of paroxysmal hypertension. There was no record of the blood pressure variations in this case before admission to the hospital. Blacklock et al. (1947) in their review observed the relationship to hypertension in 135 cases, and found 16 cases having normal blood pressure or even hypotension. Eisenberg and Wallerstein (1932) and Edward (1937) have also reported cases without any manifestation of hypertension. But the evidence of hypertrophy of the heart and the clinical diagnosis of hypertensive failure suggest that this feature of hypertension was clinically evident in this case.

The tumour was unusually large and very much pigmented, brownish in colour, partly due to the epinephrine content and partly to the pigment from the blood. The attachment of the tumour to the left kidney by a fibrous band was peculiar but taken in relation with the absence of the adrenal gland on that side showed only displacement of the tumour to the middle line. No surrounding structures were involved or infiltrated. No enlargement of the retroperitoneal lymph nodes was noticed.

Histochemically most of the tumour cells showed the chromaffin reaction. This itself is not absolutely essential for diagnosis, as Ewing has observed non-pigmented tumours derived from the chromaffin cells of the medulla. Histologically the most interesting feature was the hyperchromasia and the presence of numerous mitotic figures and giant cells of mono- and multi-nuclear type. The question of pheochromoblastoma has to be considered. Manassee (1893) found in his cases large venous sinuses invaded, but without metastases. King (1931) has also described an anaplastic type of tumour with metastases. In the present

case there was no evidence of invasion into the blood sinuses or vessels, nor was there any evidence of metastases. The capsule was intact and there was no infiltration. No further evidence of malignancy was noticed histologic-

ally or by the naked eye.

The diagnosis arrived at on post-mortem examination was fairly conclusive. The presence of large tumour, anterior and medial to the left kidney, situated in the lumbar region between the two kidneys with a broad fibrous attachment to the left kidney, the absence of the adrenal gland from its normal site at the upper pole of the kidney, the epinephrine content in the preservative fluid, the characteristic histological picture and the presence of chromaffin granules in the cell cytoplasma, afford ample evidence that the tumour was a pheochromocytoma.

Summary

A case of unusually large pheochromocytoma is reported; a short clinical note, autopsy findings, laboratory tests and histological appearances are also described.

Since this article was sent to you, sad news of Dr. T. Bhaskara Menon's death has been received from London where he had gone on deputation.-M. R. S. R.

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PLASMA PROTEINS IN PEPTIC ULCER

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Ir has now been generally accepted that the proteins of the plasma play an important part in protein metabolism, Madden and Whipple

(1940) have shown that the plasma proteins, the reserve proteins of the body, and the tissue proteins exist in a state of dynamic equilibrium, and that they can be reversibly utilized without loss of nitrogen. They have also demonstrated the influence of food proteins, and especially the quality of the latter, on the formation and level of plasma proteins.

The proteins of the plasma belong to two types, albumin and globulin, besides small amounts of proteins concerned in blood clotting and blood grouping. Recent studies by special methods have shown that there are at least two albumins and three globulins, α -, β -, and χ -globulins, in the blood plasma. These proteins have important functions. The albumin fraction, formed in the liver from the aminoacids of the ingested protein, is concerned with maintenance of the plasma volume and the regulation of fluid exchange between the blood and tissues by contributing largely to the colloid osmotic pressure of the blood, while the globulin fraction formed in the lymphoid tissues, is responsible for the immunological properties of the blood, the antibodies having been identified with modified -globulins (Kass, 1945).

Peters and Eiseman (1933) have given the normal range for plasma proteins in healthy well-nourished adults as 6.0 to 8.0 g. per 100 ml. of plasma for total proteins (average about 7.0 g.) with an albumin content of 4.0 to 5.5 g., and a globulin content of 1.4 to 3.0 g. per 100 cc. of plasma. While it is not possible to raise the amount of proteins in the plasma above the normal limit by protein feeding, a fall in the level of plasma proteins occurs as a result of continued deficient protein intake, especially if accompanied by a reduction in calories, and also as a result of a failure of absorption or utilization of ingested protein as in disease of the liver, or of abnormal destruction or loss of

protein from the body.

Since the plasma proteins are in a state of dynamic equilibrium with the reserve land tissue proteins, the level of the former may reasonably be expected to furnish an index of the status of the latter, and generally of protein nutrition. Hypoproteinæmia will therefore signify a depletion of the labile protein reserves. and probably also an impoverishment of tissues generally in their protein content. Certain organs like the liver suffer early and most in this respect. Such a state of diminished plasma protein content, although clinically it is not manifested as any definite syndrome or disease when the deficiency is not marked, naturally implies a lowered health and vitality, and a diminished resistance to infection. Cannon (1942) and Cannon et al. (1943) have demonstrated the influence of hypoproteinemia on the formation of antibodies. Madden et al. (1937) have demonstrated that hypoproteinæmic animals are susceptible to infection and, conversely, that infection hinders the regeneration of plasma proteins.

In recent years there has been a reasonable presumption that hypoproteinemia may be a cause or a contributory cause of peptic ulcer in man. This has been based on the observations of Hoelzel and Da Costa (1932) and Weech and Paige (1937) who claim to have produced peptic ulcers in experimental animals by a low protein diet, and of Matzner et al. (1938) in demonstrating the rôle of protein in the prevention of experimental ulcers. Further, several observers have recorded hypoproteinemia in patients having peptic ulcer. Co Tui et al. (1945) have not only demonstrated protein deficiency in a

The method of estimating plasma proteins was that of Wu (1922). This method, in spite of its imperfections, has, in our experience of hundreds of estimations during the past many years, given fairly accurate results for clinical purposes, comparable with other colorimetric methods. In any case, in the present study all the estimations were done by the same method under identical conditions and by the same person (B. N.) so that the results may be taken as comparable.

The results of analysis of the blood of 81 normal persons are given in table I.

Table I

Table showing the range of values for plasma proteins in 81 'normal' persons expressed as gm.

per 100 cc. plasma

		<i>por</i> 200 c	o. patenta		
Number of subjects		Total protein	Albumin	Globulin	Fibrinogen
10 27 31 13		5.0-5.5 5.5-6.0 6.0-6.5 6.5-7.0	2,38-3,33 2,60-3,81 3,02-3,85 3,30-4,29	1.52-2.65 1.74-2.98 2.00-2.78 2.39-2.96	. 0.19-0.37 0.23-0.47 0.21-0.46 0.26-0.41
Total 81	Normal range	5.0-7.0	2.38-4.29	1.52-2.98	0.19-0.47
* Mean average		6.048	3.355	2.381	0312
*Root mean so	uare deviation	0 446	. 0 336	0.334	0.064

^{*}Calculated from all the individual results.

large percentage of patients with peptic ulcer, but have also shown remarkable efficiency of a high protein diet in the form of protein hydrolysates, coupled with sufficient calorie intake, in the treatment of such patients.

This paper presents the results of a study of plasma proteins in a series of 180 patients with peptic ulcer with a view to assessing the importance of hypoproteinæmia as a causative factor in peptic ulcer.

Material and method

Plasma proteins were estimated in 180 patients including 4 females. The study extended from 1943 to 1944. All the patients were selected from the surgical wards of the King George Hospital, Vizagapatam, and were proved cases of peptic ulcer by laboratory and radiological investigations, and by operation. The normals, numbering 81 including 15 females, were selected for comparison from medical students representing the upper middle class, and from peons and out-patients presenting no gastro-intestinal symptoms, or other diseases which may give rise to hypoproteinæmic state, the latter representing the lower middle class. Thus the average normal may be taken to represent a fair crosssection of the community comparable in status and dietary habits with the subjects of investigation.

It will be seen that the average total plasma protein and also the albumin fraction are somewhat less than the accepted European standards. Even a slight reduction of the albumin fraction seems to be significant in assessing the nutritional status of a person. This reduction is to be attributed to the low protein content of the daily diet. Many of the subjects were vegetarians, and even the non-vegetarians had been having only occasional additions of meat and fish. The main source of protein in all cases consisted of pulses and other vegetable proteins, in many cases poor in quantity also. The lowered plasma average protein can, therefore, be taken as an index of the general level of nutrition among the common people of these parts of South India, especially in respect of protein; and considering that the level of plasma proteins reveals the protein status of the body tissues, it can be concluded that the physical efficiency of the community as a whole must be sub-optimal.

Table II shows the results of analysis of blood from 180 cases of proved peptic ulcer that were selected for the purpose of this study from a total of 338 analyses. Doubtful cases, and cases which were not definitely proved to have peptic ulcer, have not been included among the 180 cases selected for the study.

The average values for the different protein fractions of the plasma are more or less similar to those obtained in 'normal' persons. It is, however, interesting that the average values in the latter case are slightly less than in patients with peptic ulcer. This is explained by the fact that the analysis of the blood of the 'normal' persons was done in the latter part of 1945 and

shown by Youmans et al. (1943) that this fraction may be lower to a small extent even when the total plasma protein is of normal value in mild and early eases of hypoproteinæmia. Although a proportionate decrease in both albumin and globulin is usual in marked nutritional hypoproteinæmia, a slight hypoalbuminæmia, as seen in most of the cases

Table showing the range of values of plasma proteins in 180 peptic ulcer subjects expressed as gm. per 100 cc. plasma

			·		1
Number of subjects		Total protein	Albumin	Globulin	Fibrinogen
1* 6† 15 35 38 49 36		3.8 4.0-5.0 5.0-5.5 5.5-6.0 6.0-6.5 6.5-7.0 7.0-7.5	2.37 1.60-2.90 2.30-3.44 2.45-4.06 2.65-4.02 2.80-4.61 2.69-4.31	1,19 1,40-2,86 1,50-2,50 1,32-3,20 1,90-3,50 1,84-3,95 2,36-4,20	0.24 0.23-0.38 0.22-0.53 0.20-0.44 0.22-0.51 0.21-0.53 0.28-0.70
Total 180	Range	3.8-7.5	1.60-4.60	1.19-4.20	0.21-0.70
Mean average	values‡	6.368	3.463	2.567	0.338 .
Root mean so	quare deviation‡	7.7221	0.4876	0.5375	0.0906

^{*}The subject is emaciated. i Two of the cases had cedema of legs and hands. ‡Calculated from all the individual values.

carly part of 1946; and the conclusion seems to be permissible that the difference between the two groups shows that through the intervening years between the analysis of the ulcer group and of the normal group the nutritional status of the population has been slowly and steadily deteriorating, probably as a result of the difficult food problem in the country.

Discussion

A scrutiny of the figures in tables I and II reveals that there is slight hypoproteinæmia which is general among the population represented by the subjects of our study. The albumin is the most significant fraction in respect to nutritional protein deficiency, and it has been

studied, is significant denoting either a low protein intake or liver dysfunction. That liver dysfunction is commonly present in patients with peptic ulcer has been reported by many workers, and physiologists have pointed out that experimental liver damage is followed in many instances by the development of peptic ulcer (Trowell, 1944). Our own observations using the van den Bergh reaction, lævulose tolerance test and the serum colloidal gold reaction (Gray, 1940) show that liver dysfunction can be demonstrated in a good number of cases of peptic ulcer, the colloidal gold reaction being the most sensitive of the tests employed by us. A few illustrative cases are given in table III.

Table III

Table illustrating some cases of peptic ulcer showing liver dysfunction

Name	Age and sex	van den Bergh test	Colloidal gold reaction	Remarks
Pydithalli Ramaraju Satyarao Thavudu Veeranna	26, male 30, " 15, ", 25, ", 30, ",	Direct delayed Do. Direct delayed (bilirubin— 1 unit). Direct delayed (bilirubin— 2.3 units). Indirect positive	2532100000 4453200000 4432100000 2221000000 5553332000	Cicatrizing duodenal ulcer. Active duodenal ulcer. Duodenal ulcer. Active duodenal ulcer. Duodenal ulcer.

However, we have not been able to demonstrate liver dysfunction invariably in all cases of peptic ulcer, nor peptic ulcer in cases where there was liver dysfunction, as shown by the colloidal gold test and marked hypoproteinæmia. Hence we have to conclude that the slight hypoalbuminemia observed in eases of peptic ulcer cannot be exclusively due to liver dysfunction, although we have observed a more pronounced lowering of plasma proteins in a few cases of peptic ulcer showing definite liver dysfunction. The similar hypoalbuminæmia in the normal persons investigated is significant evidence that the cause of the condition is identical in both the groups, that is primarily nutritional and not due to hepatic

Although animal experiments of Hoelzel and Da Costa (loc. cit.) and of Weech and Paige (loc. cit.) suggest that hypoproteinæmia may be of ætiological importance in the experimental production of the peptic ulcers, on that basis we shall not be justified in assuming that in human subjects with peptic ulcer this factor plays a parallel rôle of equal importance, inasmuch as the degree of hypoproteinæmia in peptic ulcer cases has not been found to be very marked on the one hand, and on the other peptic ulcer was not observed in a single instance in a large series of cases of tropical ulcer of the leg, which we investigated in 1943 to 1944 and which showed marked hypoproteinæmia. The total protein ranged from 4.4 to 5.5 g. per 100 cc. plasma, and the albumin-globulin ratio was reversed showing a range of 0.7 to 0.4. Thus in tropical ulcer cases there was marked hypoalbuminæmia, with higher values globulin and fibrinogen. We have recently studied many cases of nutritional hypoproteinæmia where the total protein was near about 4.0 g. per 100 cc. plasma. In many of the anæmia cases we investigated there was marked hypoproteinamia. None of these cases presented any evidence of peptic ulcer.

We have therefore to conclude that hypoproteinæmia per se is not a causative factor in peptic ulcer, although it is possible that in marked plasma protein depletion the tissues of the gastro-intestinal wall may suffer the same reduction in structural protein with consequent lowered resistance to injury. Further it has been shown by several observers that hypoproteinæmia adversely affects wound healing, so that hypoproteinæmia may be one of the factors that help to perpetuate a peptic ulcer when once formed. The recognition of these facts is important from the standpoint of medical and surgical treatment of peptic ulcer.

Summary

A comparative study of the various fractions of the plasma proteins of 81 normals and 180 peptic ulcer cases and a series of cases of tropical ulcer of the leg, of nutritional hypoproteinemia, and of anemia was made. The average protein

content of the peptic ulcer cases was found to be the same as that of the normals. The rôle of hypoproteinæmia in the ætiology of the peptic ulcer has been discussed. No relation could be found between hypoproteinæmia, liver dysfunction and peptic ulcer as to confirm the suggestion that hypoproteinæmia is of ætiological importance in the peptic ulcer.

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PNEUMONIC PLAGUE AND ITS TREATMENT

By P. M. WAGLE, M.D., D.P.H.

and

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PRIMARY pneumonic plague has been known to occur in cold climates such as that of Eastern Siberia and Manchuria, but fortunately it is known to occur comparatively rarely in India. In India cases are reported to have occurred mostly in northern parts of India, especially at the base of the Himalayas, but occasionally cases have been reported from other parts as It is known that in these cases infection of the lungs takes place by droplets of infected sputum. It has been mentioned in the textbooks that pneumonia caused by P. pestis is usually of a lobular type. We have however come across during the course of field investigations extending over a period of ten years, both the lobular and lobar types of consolidations caused by this organism. In early stages of infection when signs of congestion and consolidations are detected in the lungs, plague bacilli have been found in enormous numbers in the sputum, but if cultures of blood of the patient

are done at this stage, they have usually proved sterile. At a later stage, an invasion of blood has been noticed, and organisms have been isolated from the blood.

Clinically, the patient has always looked more acutely ill than in the case of streptococcal or pneumococcal pneumonia, and has usually been found to be extremely restless. In the lobular or broncho-pneumonic type the patient is seen to expectorate dark-coloured blood teeming with plague bacilli. In the lobar type the sputum has been found to be stringy in character, often rusty or mixed with blood, and difficult to expectorate. In some cases there has hardly been any expectoration. Smears made from the sputum have shown typical bipolar organisms. Blood examination has usually shown presence of leucopenia in the majority of cases, although in a few cases we have found a normal leucocytic count or a leucocytosis.

In secondary pneumonic plague, the infection of the lung is known to be secondary to infection of the lymphatic system or the blood stream. So when the plague bacilli have been found in the sputum in these cases, it has always been possible to culture them either from the bubo or the blood at the same time. The leucocytic picture depends upon the primary infection. Usually there has been a leucocytosis but occasionally cases have shown leucopenia.

Until the discovery of sulphonamides, both these forms of disease were attended with almost cent per cent mortality. Even after the discovery of sulphonamides, amongst the cases treated with these drugs, only an occasional recovery has been reported upon. Munter (1945) has reported a recovery of a case of primary pneumonic plague after treatment with sulphadiazine.

In the course of field trials we have had the occasion to treat 24 cases of pneumonic plague during the period of ten years; 6 in the field trial conducted at Manchar in Poona district in 1948, and 18 in various other field trials conducted in different parts of India, such as Bettiah (Bihar), Latur in Hyderabad (Deccan) and others. Fifteen of these cases were of primary pneumonic plague, and nine of secondary pneumonic plague. Of the latter 18 cases, 11 were treated with sulphathiazole, 5 with antiplague serum, and 2 with iodine. Amongst the 11 cases treated with sulphathiazole, 5 cases had received 4.0 g. of the drug daily, 4 cases 6.0 g. daily, one case 10.0 g., and one case 14.0 g. daily. Of the 5 cases treated with anti-plague serum, 3 cases had received 20 c.cm. serum a day, one case received 40 c.cm. a day and one received 80 c.cm. a day. The two iodine cases had received the usual iodine treatment in vogue some years ago (Wagle et al., 1941). All these cases, however, proved fatal within three days except two cases treated with sulphathiazole, one of which survived for 6 days and another for 10 days.

In view of this previous experience in the various streptomycin it was decided at Manchar, where streptomycin was being tested in bubonic plague cases early in 1948, that, should a pneumonic plague case be admitted, reliance should not be placed on any single drug, but combined treatment with two or even more drugs should be given with the sole object of saving the life of the patient. Six cases—three of primary pneumonic plague and three of secondary pneumonic plague-were admitted for treatment during this trial and received combined treatment. Five of these cases recovered and one died. This result was unexpected and striking, and so it was considered desirable to communicate these findings, although it is not known exactly which drug played a prominent rôle in saving the life of the patient. One is, however, inclined to attribute the main rôle to streptomycin owing to its remarkable curative action in bubonic plague infection, as reported by Sokhey and Wagle at the Fourth Inter-national Congress on Tropical Medicine and Malaria, held at Washington, D.C. (Sokhey and Wagle, 1948).

The particulars regarding the treatment in these six cases are given in the Appendix. The drugs used for combined treatment were streptomycin, sulphamerazine and anti-plague serum.

Dosage

Streptomycin was given in a dosage of 2/3 g. intramuscularly every 4 hours during the acute stage of the disease, and the dosage was slowly reduced as the clinical condition of the patient improved. It was continued until it was definite that the convalescence had been established.

Sulphamerazine was given in an initial dose of 2.0 g. followed by 1.0 g. 4 hours later. Thereafter 1.0 g. was given every 8 hours. In case 177, an initial dose of 4.0 g. was given, and in this case the subsequent dosage was increased when the clinical condition necessitated it.

Anti-plague serum.—The daily dosage was 80 c.cm., administered in two intramuscular doses of 40 c.cm. each, one being given in the morning and the other in the evening. A maximum of 200 c.cm. was given in any case.

In cases which appeared serious clinically on admission, combined treatment was commenced immediately. In cases which appeared less serious on admission, treatment with a single drug was given to start with, but later if the patient's condition grew worse, other drugs were given in addition.

Comments

The Appendix gives particulars of three cases of secondary pneumonic plague and three cases of primary pneumonic plague. The dosage of the various drugs given during the first five days of illness, the total quantity of drugs received by

Appendix

1 day 2nd day 1 day 2nd day 20 gm, 4.0 gm. 20 gm, 4.0 gm. 30 gm, 30 gm. 30 c.c. 4.0 gm, 4.0 gm. 4.0 gm, 4.0 gm. 4.0 gm, 2.0 gm. 2.0 gm, 2.0 gm. 2.0 gm, 2.0 gm.	the said water the said and sa		T Ocal	of days	
Positive. 7,300 P. positis in *STM FSM 9.0 gm. 4.0 gm.	3rd day 4th day	ıy 5th day	quantity of drugs given	the drugs were given	Remarks
† SM 9.0 gm. 4.0 gm. APS		4.0 gm.	15.33 gm.	5 days	1. Signs of congestion over the right lower lobe on
Negative 3.950 No examina- STM 4.0 gm.	.0 gm. 3.0 gm.	1. 3.0 gm.	35.0 gm.	11 days	admission, later consolidation. 2. Tenneralme normal after
Negative 3.950 No examina- STM 4.0 gm. 4.0 gm. as there was no expectoration during a state was no expectoration during acute stage of a liness. Negative 3,100 P. peslis in STM 4.0 gm. 4.0 gm. Independent STM 4.0 gm. 4.0 gm. APS 80 c.c. SO c.c. . 80 c.c.	80 c.c.	160 e.c.	2 days	114 hours. Disch cured.	
as there was no expectora- tion during acute stage of illness. 'Negative 3,100 P. pestis in STM 4.0 gm. 4.0 gm. Iarge numbers. SM SM APS 80 c.c. 80 c.c. large numbers. SM 4.0 gm. 4.0 gm. large numbers. SM 4.0 gm. 4.0 gm. large numbers. SM 2.0 gm. gm. and About 2,000 because there was no expectora- SM 2.0 gm. tion. the Positive. and expectora- SM 2.0 gm. tion. tion. large numbers. SM 2.0 gm. darge numbers. SM 2.0 gm. darge numbers.	.0 gm. 3.33 gm.	n. 2.66 gm.	38.0 gm.	14 days	1. Signs of consolidation over the right middle and lower
acute stage of an APS 80 c.c. Negative 3,100 P. pestis in STM 4.0 gm. 4.0 gm. and an APS 80 c.c. Negative 5,100 P. pestis in STM 4.0 gm. 4.0 gm. and About 2,500 Roceause there was no expectoral from tinal. About 2,500 P. pestis in STM 4.0 gm. 2.0 gm. and About 2,500 P. pestis in STM 4.0 gm. 4.0 gm. tion.	3.0 gm. 3.0 gm.	n. 3.0 gm.	33.0 gm.	11 days	2. Temperature normal after 87 hours but moduling
Negative 3,100 P. pestis in STM 4.0 gm. 4.0 gm.	80 c.c. 40 c.c.	:	200 c.c.	3 days	scharged cured
5,100 P. postis in STM 4.0 gm. 4.0 gm. large numbers. 21,400 Not done STM 4.0 gm. 2.0 gm. because there was no expectora- SM 2.0 gm. tion. S0,500 P. postis in STM 4.0 gm. 2.0 gm. large numbers.	4.0 gm. 1.0 gm.	n. 4.0 gm.	34.0 gm.	10 days	1. Signs of consolidation over both lower lobes on admis-
5,100 P. postis in STM 4.0 gm. 4.0 gm. large numbers. APS 80 c.c. 80 c.c. APS 80 c.c. 80 c.c. APS 40 c.c. APP 50 cm. APP 50 cm. APP	:	:	:	2 days	perature no
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Positive. 21,400 Not done STM 4.0 gm. 2.0 gm. About 2,000 Lion. Lion. SM 2.0 gm. 2.0 gm. Lion. Positive. 20,500 P. positis in STM 4.0 gm. 4.0 gm. colonies.	2.66 gm. 2.66 gm.	n. 2.33 gm.	17.0 gm.	7 days	1. Signs of consolidation over the middle and lower lobes of right lime on
21,400 Not done STM 4.0 gm. 2.0 gm. because there was no expectora- SM 2.0 gm. 2.0 gm. tion. 20,500 P. postis in STM 4.0 gm. 4.0 gm.	:	:	40 c.c.	1 day	ion. ion. rature touch I after 86 hou rged cured.
there was no expectora- SM 2.0 gm. 2.0 gm. tion. 20,500 <i>P. postis</i> in STM 4.0 gm. 4.0 gm.	:	:	6.0 gm.	14 days	
Positive. About 2,500 P. pestis in STM 4.0 gm. 4.0 gm. colonies.	:	•	4.0 gm.	11 days	on admission. Died on 2nd day.
	4.0 gm. 4.0 gm.	л. 4.0 gm.	35.0 gm.	10 days	1. Signs of consolidation over right lower lobe on admis-
APS 80 c.c. 80	80 c.c. 40 c.c.	•	200 c.c.	3 days	sion. 2. Temperature normal after 146 hours. Discharged cured.

each ease, and the number of days the different drugs were administered are all included. It will be seen that two cases received all the three drugs, three received streptomyein and antiplague serum, and one case received streptomycin and sulphamerazine. All cases thus received streptomycin. Of the three primary pneumonic cases, all recovered, while one death took place amongst the three secondary pneumonic plague cases. In cases 146 and 208, no bacteriological evidence in support of the pneumonia being of plague origin could be gathered as the patients did not expectorate any sputum during the acute stage of illness. However, judging from the extreme restlessness and prostration present in the patients on admission, and history of occurrence of other plague cases in their houses previously, it left no doubt in our mind that the two cases had developed pneumonic plague. Considering that all the pneumonic plague cases treated previously either with serum or sulphathiazole, etc., had proved fatal, it was striking that 5 out of 6 cases of present series recovered with the combined treatment. It appears that in combined treatment with streptomycin, antiplague serum and sulphamerazine, we have found a potent weapon in fighting pneumonic plague.

Summary

1. An account of 24 pneumonic plague cases treated with different drugs in the last ten years

is given.

2. It is found that combined treatment with streptomycin and anti-plague serum with or without sulphamerazine gave best results. Five cases out of six which received combined treatment recovered.

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OBSERVATIONS OF ASCORBIC ACID

Part XI.—THERAPEUTIC EFFECT OF ASCORBIC ACID IN TUBERCULOSIS

By INDER JIT BABBAR

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In a previous communication (Babbar, 1948) the plasma concentration of ascorbic acid in health and pathological conditions was reported. Now the therapeutic effect of ascorbic acid in tuberculosis has been studied.

A number of workers (Pijoan and Sedlacek, 1943; Sebok and Preztai, 1937; Hasselbach, 1937; Bakhsh and Rabbani, 1939) have reported on the therapeutic effect of the adequate amounts of ascorbic acid intake on human tuberculosis. The results are inconclusive mainly due to the inadequate use of controls and unsatisfactory criteria of watching the progress of the disease.

The approach used by Radford, de Savitsch and Sweany (1937) and Kaplan and Zonnis (1940) meets the above objections admirably. In the present study, we were interested in determining, at least, some of the various findings such as blood elements (red cells, hæmoglobin, differential count, sedimentation rate, etc.), weight, appetite, etc., could be altered by the administration of ascorbic acid.

In the experiments, about one hundred and sixty tuberculous and some non-tuberculous patients were examined (table I) out of which seventy-four were selected for study. One-half of these were placed in the experimental group and the other half used as controls, each patient in the experimental group was matched with one in the control group with respect to race, sex, stage of disease, treatment received and economic status. Care was taken to have the two groups as nearly alike as possible.

Plasma concentration of ascorbic acid was determined on both the groups of patients by the method of Farmer and Abt (1936).

It is more or less generally accepted that a plasma concentration of 0.70 mg. per cent is the lower normal limit. A great variation was recorded in the plasma level of vitamin C ranging from as low as 0.15 mg. per cent to as high

TABLE I

Nu	MBER OF PATI VITAM	ENTS WITH	Subnorm 4L	Number of patients with normal vitamin C values			
Pulm	onary tubered	alosis	Non-tuberculosis	ulosis Tuberculosis			Non-tuberculosis
1st stage	- 2nd stage	3rd stage		1st stage	2nd stage	3rd stage	
14 Range 0.15-0.66 mg. %	43 Range 0.16-0.65 mg. %	47 Range 0.16-0.62 mg. %	18 Range 0.3-0.56 mg. %	7 Range 0.692-1.02 mg. %	2 Range 0.735-0.74 mg. %	5 Range 0.71-1.00 mg. %	5 Range 0.69-1.24 mg, %

as 1.24 mg. per cent. If we accept the 0.7 mg. per cent as lower normal limit, we find that 4.4 per cent of our moderately advanced patients and 9.6 per cent of our far-advanced patients showed values of 0.7 mg. per cent or higher.

TABLE II

Plasma vitamin C level after giving vitamin C, 200 mg. daily, over a period of $2\frac{1}{2}$ months along with the diet

Initial		Lowest	Highest	Average	
Initial 1½ months 2½ months		0.12 0.42 0.68	0.69 0.89 0.92	0.46 0.67 0.82	

The patients in the experimental groups were given 200 mg. vitamin C (B.D.H.) orally in four divided doses daily for a period of $2\frac{1}{2}$ months. Blood determinations were repeated first after 15 days, then after one month's administration. It was found that a 1½-month period is sufficient

this observation the writer concludes that long administration of vitamin C has no appreciable effect at all on the changes in B.S.R.

My thanks are due to Dr. B. K. Sikand, Medical Superintendent, New Delhi Tuberculosis Clinic (Irwin Hospital), for valuable advice during the course of the investigation.

My thanks are also due to the Tuberculosis Association of India for meeting a part of expenses in this inquiry.

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TABLE III

-		Experi- mental	Control		Experi- mental	Control
(1)	Weight					
, ,	Percentage showing gain	30	20	Percentage showing loss	10	40
(2)	Subjective feeling Percentage feeling better	90	25	Percentage feeling worse	10	60
(3)	Hæmoglobin		20	referrage reening worde		
	Percentage showing increase	72	25	Percentage showing decrease	16	15
(4)	R.B.C. Percentage showing increase	66	10	Percentage showing decrease	16	15
(5)	Staff cells in Schilling count	1		, z otobienego milo mag		
, ,	Percentage showing decrease	40	33	Percentage showing increase	30	25
(6)	Lymphocytes	**	40		00	28
/	Percentage showing increase	52	42	Percentage showing decrease	23	20
(7)	BS.R. Percentage showing decrease	30	36	Percentage showing increase	20	24
	}	1		,		

to increase the plasma level to normal value. Blood determinations in controls were made before and at the end of the experiment, as no significant changes could be expected to have taken place during $2\frac{1}{2}$ months.

In table III are given the results of blood analysis in treated group at the end of $2\frac{1}{2}$ months' experimental period.

The treated group shows a marked increase in hæmoglobin percentage and R.B.C. in blood. On the whole subjectively the tests show a great progress. Staff cells and lymphocytes show no significant change.

Much emphasis was laid at the decrease in blood sedimentation rate by Heise, Martin and Schwartz (1937) who also suggested that the prognostic significance of B.S.R. may have to be revaluated and interpreted in the light of vitamin C saturation in patients. On repeating

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THE ACTION OF SHIGA TOXINS ON LABORATORY ANIMALS IN GENERAL AND ON MONKEYS IN PARTICULAR

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Boivin (1941) has described the characteristics of two types of toxins in Shiga bacillus, i.e. exotoxin and endotoxin; the former causes paralysis in mice and the latter diarrhea. The endotoxin has a very low degree of toxicity, the chief and important toxin of the Shiga bacillus is the exotoxin, which does not produce dysentery in mice, guinea-pigs or rabbits. Paralytic

symptoms either do not occur in human beings affected with Shiga dysentery or are very rare. . No work appears to have been carried out on the action of the two toxins of Shiga bacillus on laboratory animals closely related to man, viz. monkey. It was therefore considered advisable to investigate the action of the two toxins of Shiga bacillus on monkeys (Macacus rhesus) in comparison with their action on other laboratory animals.

The methods of preparation of the two toxins were as follows :-

Shiga exotoxin.—The rough Shiga strain (D-6-F IV) which can produce only the exotoxin was seeded on 100 rolled agar bottles for preparation of one batch. The 20 to 24-hour growth was harvested and the organisms washed twice with saline and re-suspended in ten times their weight of normal saline. After the addition of chloroform, the organisms were incubated at 37°C. for 3 days and then centrifuged. supernatant fluid containing the exotoxin was cooled to 0°C., the exotoxin was precipitated by the addition of a suitable amount of a strong solution of trichloracetic acid at a pH of 3.5.

Trichloracetic acid was used as it has comparatively very slight deleterious action on the toxin to be precipitated and is not carried down to any appreciable extent by the precipitated toxin. The deposit obtained after centrifugalization was dissolved in a small volume of N/100 sodium hydroxide, which also helped to neutralize the excess of trichloracetic acid that might have been The exotoxin thus left after precipitation. obtained was dried in a vacuumized desiccator

over phosphorous pentoxide.

It is extremely important to work out carefully the amount of trichloracetic acid which is to be added to the bulk of the supernatant fluid containing the exotoxin. Several batches of the exotoxin precipitated with different amounts of trichloracetic acid were titrated against the British Standard Shiga antitoxin. When excess of trichloracetic acid was used for precipitation, the L + dose of the dried toxin rose from 0.63

mg, to 3.25 mg.

endotoxin.—Several smoothShiga strains were obtained and tested for pathogenicity by intraperitoneal injection into mice. The most virulent strain was selected and seeded each time on 100 rolled agar bottles. The 20 to 24hour growth was harvested and washed three times with saline, 250 cc. of 50 per cent trypsin in distilled water were added to the bacilli, the pH was adjusted to 8.5 and digestion was allowed to proceed at 37°C. for one to two weeks, chloroform being added to prevent decomposition. The digested bacillary bodies were centrifuged, trichloracetic acid was added to precipitate the neurotoxin and other non-specific proteins. Chloroform was added to the supernatant fluid, which was dialysed first against tap-water for 48 hours and then against distilled water in the After dialysis, the supernatant cold room. fluid was mixed with five times its volume of acetone and a trace of hydrochloric acid for precipitation of the endotoxin, which was washed first with acctone and then with ether. It was finally dried over phosphorous pentoxide in a

vacuumized desiccator.

Action of shiga exotoxin.—One monkey (2,910 gm.) injected intravenously with 1.0 mg. of Shiga exotoxin looked ill and lay down 18 hours after the injection (the MLD for 15 to 20 gm. mice being 0.015 mg.). It died 23 hours after. During the period of observation it was found lying down with eyes closed and looked apparently paralysed, no blood or mucus was passed per rectum.

Another monkey (2,720 gm.) injected with 1.5 mg. of the exotoxin died after 19 hours with

similar symptoms.

On post-mortem examination, slight general congestion of most of the organs was noticeable, patchy congestion with punctiform hamorrhages was found in the lungs and pericardium. Waterclear effusion was observed in the pleural and pericardial cavities in one out of two cases.

Nine monkeys were injected intraperitoneally with Shiga exotoxin, the dose varied from 1.0 mg.

The MLD was found to be 1.5 mg. (weight of monkey-3,290 gm.). The monkeys were off food, quiet, lay down and died in 12 to 74 hours. Four of them had no intestinal disturbances at all, two had moderate diarrhea, another two passed semi-solid reddish stools. Only one monkey dying within 24 hours showed the presence of blood, and mucus in the stools, an organism morphologically and biochemically similar to Flexner bacillus was isolated from the stools but it could not be agglutinated by a Flexner polyvalent serum. The inagglutinable Flexner bacillus had obviously been present scantily as a saprophyte and multiplied when the resistance of the monkey was broken down by the administration of Shiga exotoxin.

On post-mortem examination, blood-stained fluid was found in the peritoneal cavity in variable amounts and there was marked congestion of omentum, mesentery and peritoneal wall. A variable degree of congestion of the outer wall and mucous membrane of the stomach, small and large intestine was observed. Patchy conjestion and thickening of the mucous membrane with occasional hæmorrhages were fairly often evident. The lesions on the whole were

more marked in the large intestine.

The MLD of the exotoxin for rabbits injected intraperitoneally was found to be 0.5 mg., the rabbits were ill, lay down and died in 22 to 24 hours, there was slight or no diarrhea.

The guinea-pigs were found to be more or less insusceptible to the intraperitoncal administration of Shiga exotoxin, even a dose of 20 mg. had

no appreciable ill-effect.

Shiga endotoxin.—The endotoxin which was lethal to mice (20 to 25 gm.) by the intraperitoneal route in a dose of 1.0 mg. was injected intraperitoneally into a monkey (3,520 gm.)

in a 120 mg. dose. The monkey became quiet and lost weight but remained otherwise normal.

Another batch of endotoxin had an MLD of 0.15 mg. by the intraperitoneal route for mice weighing 16 to 20 gm. Four monkeys were injected intraperitoneally with doses varying in 116 to 287 mg., the MLD was found to be 140 mg., death occurred in different monkeys from 6 to 31 hours. They looked ill, lay down and died, there was no diarrhea. On postmortem examination, a small amount of bloodstained peritoneal effusion was found in some cases but not in others, and a variable degree of congestion of stomach and intestines was noticed. Marked congestion, ædema of the mucous membrane and submucous hæmorrhages were frequent in the intestines especially in jejunum and ileum. Supra-renal cortex was found generally to be congested.

The MLD of the endotoxin by intraperitoneal route for guinea-pigs, 200 to 350 gm. in weight, was 3.0 mg. They looked ill and died in 4 to 5 days. There was no evidence of any diarrhæa.

Both the exotoxin and endotoxin failed to produce dysentery on intraperitoneal injection into monkeys, the action of Shiga bacillary

bodies was next investigated.

Two monkeys were injected intrapcritoneally with Shiga bacillary bodies. The injection of 6.0 mg. of desiccated live bacilli caused the appearance of slight diarrhea and Flexner bacillus was isolated from the stools. The second monkey injected with 10.0 mg. of bacillary bodies died in 4 days, it was quiet and off food but there was no apparent gastro-intestinal disturbance. The presence of Flexner bacilli in a saprophytic state in a certain percentage of healthy monkeys is well known. It is not difficult to isolate these organisms if the resistance of such monkeys is lowered by various methods, e.g. diet deficient in vitamins, administration of toxins, etc.

Boivin (loc. cit.) reported that the endotoxin acted especially on the small intestine of rabbits and guinea-pigs, whereas Istrati (1938) observed that in the case of rabbits, the neurotoxin acted mainly on the large intestine especially the execum. In the present series of experiments, the lesions in monkeys produced by both the toxins were more or less similar to those observed in rabbits. The large intestine was specially but not always affected by the exotoxin and the endotoxin acted more specifically on the small intestine, but the endotoxin had to be injected in

massive doses to produce any result.

Summary

The action of Shiga exotoxin on laboratory animals with special reference to monkeys has been described.

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CEREBRAL SYMPTOMS IN BENIGN TERTIAN INFECTION

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Benign tertian malarial parasites have never or very rarely been held responsible for producing symptoms of cerebral infection. Textbooks are almost silent regarding the discussion of such a possibility. Subtertian parasite, by virtue of its small size and its special predilection to invade the brain, has been always found to be the only parasite producing cerebral and other unusual symptoms. The ring of benign tertian parasite measuring double the size of that of subtertian parasite (3 magainst 1.5 \(\mu\)) and its schizont stage attaining a large size—larger than a blood corpuscle $(9\mu$ to 10μ) -may account for the difficulty or rather the supposed impossibility of the parasite to invade freely the various tissues of the body including the central nervous system. But one cannot be too dogmatic on the assumption.

Gupta and Laha (1944) report a case of hemiplegia in chronic malaria which has been successfully treated with quinine. Chronicity is almost always more commonly associated with benign tertian infection and in the above case though the peripheral blood did not show any parasites, the condition seems to have been most probably of a benign tertian infection. Massive epistaxis in benign tertian malaria has also been reported by Laha (1945). The following case observed and treated successfully by the writer would prove the possibility of benign tertian parasite infecting the tissues of the brain:—

M., 4-year-old Hindu male child, was admitted into hospital with the following complaints: Daily afternoon rise of temperature with rigor and fever coming down with sweats in the morning—duration 20 days; spastic paralysis of both legs—duration one week; aphasia—duration 4 days.

Physical examination

On admission at 10 a.m. on 23rd March, 1948, the child was afebrile, pulse 110 per minute, respiration 28 per minute and there was anæmia. The spleen was enlarged and palpable two inches below the costal margin. Both the lower extremities were paralysed with spasticity, tendon jerks were slightly increased but there was no loss of sensation. Superficial abdominal reflexes were absent and the plantar reflexes were extensor. There was complete loss of articulated speech and the child was speechless though he could understand what was said and respond to them by signs; he could cough, yawn, open his mouth and chew his food. In the heart were audible hæmic murmurs in the pulmonary

area; in the lungs there was no abnormality and the liver was not enlarged.

Investigation

At the height of the fever in the afternoon of the day of admission and on the day following blood slides of the peripheral blood were taken. The slides on careful and repeated examination showed benign tertian infection only; no subtertian forms were detected. Hæmoglobin 65 per cent, total R.B.C. 3,380,000 per c.mm. and total W.B.C. 6,200 per c.mm., polymorphs 64 per cent, lymphocytes 26 per cent, large mono. 9 per cent, cosino. 1 per cent, baso. nil.

Treatment

For the first two days, the child was kept under observation with alkali mixture only so that the malaria parasites could be studied on at least two occasions. On the third day quinine bihydrochlor gr. 5 was injected intramuscularly in the gluteal region and on the fourth day the dose was repeated with the result that the usual rigor and fever in the afternoon stopped on the fourth day. At about 8 p.m. in the night the child for the first time uttered a few words and the following morning he was completely free in his speech. Quinine by mouth being continued, the movement of the legs commenced on the 6th day and by the 7th day of the admission the child could walk about though the movement was not very free. A day or two later the movement of the child became completely free. With the return of power in the legs and of the power of speech, the reflexes became normal. On the tenth day of the admission the relatives removed the child to their own place. Up till now the child is keeping fit with usual physical and mental growth.

Discussion

The condition was obviously due to infection of the central nervous system by the benign tertian malaria parasites as no subtertian forms were detected in the stained blood slides after repeated examinations. The sudden onset and quick and complete recovery suggested that the lesion was embolism. Since the ease responded to quinine successfully the embolus seems to have been caused by the benign tertian parasites.

If generalization be permissible children seem to be more susceptible to this type of infection than adults. All the three cases—hemiplegia in chronic malaria (Gupta and Laha, 1944), massive epistaxis (Laha, 1945) and the present case—belong to the same age group.

The positive evidence of the benign tertian parasite infecting the brain as shown in the present article would rule out the presumption that the malignant forms are the only forms of malaria parasites that affect the brain tissue.

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Reference may also be made to the Correspondence on the same subject on p. 443. It may be difficult at times to detect M.T. parasites in mixed infections.— Editor. I.M.G.1

SEROLOGICAL TECHNIQUE (contd.)

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CONCENTRATION OF ANTISERA

Concentration of antivenene by the method adopted by the author at Kasauli in 1934 will be described as an example. The author produced the first concentrated antiserum fit for issue to the public in India. The method is still in use.

The Technique

Separation of the active substance (pseudoglobulin).—To the plasma of immunized horses (obtained by adding to the blood 1 per cent of a 10 per cent solution of sodium oxalate and preserved by the addition of 0.7 per cent of a mixture of equal volumes of trikresol and ether) are added (a) 3 per cent of a 4 per cent solution of calcium chloride, (b) two volumes of tapwater, and (c) of the total volume so obtained about 18 per cent of ammonium sulphate. The specific gravity is adjusted to 1098 (should not be above 1098, may be 1097) by adding more of the salt or tap-water. After half an hour the specific gravity is found to be about one degree higher. It is finally adjusted to 1099 (should not be above 1099, may be 1098) and the mixture filtered through chain cloth folded like a concertina along the border to fit a funnel. The filtrate is returned to the filtering cloth until it comes through clear. The precipitate on the cloth represents the fibrin and the euglobulin. In the clear filtrate pass the pseudoglobulin and the albumen. The precipitate is rejected.

To the filtrate after measurement is added about 10 per cent more of the ammonium sulphate and the specific gravity adjusted to 1133 (should not be below 1133, may be 1134). The mixture is stirred, allowed to stand for half an hour, stirred again and filtered through another piece of chain cloth. The precipitate collected on the cloth represents the pseudoglobulin. In the filtrate passes out the albumen. The filtrate is rejected.

The precipitate is scraped towards the middle of the cloth with an ivory spatula. The cloth is folded in such a way over the precipitate as to leave no folds and dead spaces. It is then subjected to pressure in a hand press. The pressure is applied at first gradually then

increased quickly until dripping ceases. The hard-pressed precipitate is removed from the cloth as a cake.

In the first filtration (for the removal of the fibrin and the euglobulin) as much of the filtrate is collected as possible. It is an advantage to use a round piece of chain cloth to reduce the absorption by the cloth to a minimum. Further, small quantities of an 18 per cent solution of ammonium sulphate (specific gravity 1099) are poured on the filtering surface near the border until the drippings are free from colour. This additional quantity of filtrate is added to that first collected.

After the second filtration (for the collection of the pseudoglobulin) the precipitate is pressed as hard as possible. For this purpose a square piece of chain cloth is an advantage.

Removal of ammonium sulphate.—The cake is weighed, broken up and put in bags of cellophane (No. 300), in quantities of about 100 gm. for each. The bags are suspended in running cold water.

In 12 hours the contents of the bags are found to be liquid, clear and increased in bulk. The bags are now gently squashed and allowed to sink further to increase the surface for dialysis. In 24 hours the contents begin to turn turbid. The turbidity increases steadily and is at a maximum in 96 hours. By this time the ammonium sulphate has dialysed out.

To test the completion of the dialysis the flow of water is stopped for 15 minutes and the film of water on the bags is collected by lifting them into a Petri dish. The film-water is matched against the tap-water after adding to both, in two test-tubes, a few drops of a solution of barium chloride. A perfect matching of the turbidity shows that, for all practical purposes, the ammonium sulphate has been removed.

The dialysate is collected into a bottle to which are also added washings from the bags (using distilled water) to bring the total quantity up to a convenient figure. The original volume of plasma divided by the volume of the total dialysate gives the degree of concentration.

Clearing and preserving of the dialysate.—To the dialysate is now added 1 per cent of sodium chloride which at once turns the turbid and viscid fluid into a clear, less viscid and translucent product of slightly greenish hue. The pH is generally found to be between 6.9 and 7.1 and is adjusted to 7.5 or 7.6 with sodium carbonate. A preservative, 0.7 per cent of a mixture of equal parts of ether and trikresol, is next added and the bottle left undisturbed for two weeks. A whitish sediment, consisting mostly of euglobulin (carried over with the pseudoglobulin in the process) and fibres from the chain cloth, collects and clears the product further.

Tests of potency and toxicity.—A sample is now tested for potency and toxicity. If the titre of protection is satisfactory and the product is not toxic it is passed through a Seitz filter and bottled.

Titration of antivenene.—The unconcentrated serum previously issued from Kasauli is prepared by immunizing horses with venom of cobra and Russell's viper. It satisfies the following standard of potency:—

(i) One cc. mixed with 1 milligram of dried viper venom, dissolved in 1 cc. saline, saves a pigeon between 290 and 310 gm. in weight. The mixture is injected intravenously immediately after it is made. The results are available in 5 to 15 minutes. The MLD of the viper venom, when injected intravenously, lies between 0.01 and 0.04 milligram. The serum, thus, protects against 25 to 100 MLD. This test was introduced as a result of Anderson's work (Anderson, L. A. P., 1932; Indian Journal of Medical Research, 20, p. 1).

(ii) One cc. mixed with 0.5 milligram of

(ii) One cc. mixed with 0.5 milligram of dried cobra venom (dissolved in 1 cc. saline) over and above one MLD and incubated for half an hour at 37°C. protects a pigeon between 290 and 310 gm. in weight. The mixture is injected intramuscularly and the results are read in 24 hours. The MLD is determined at the same time, thus:—

	Ven	Venom in milligrams (for MLD)				ı in	e, and milli- titre)
	0.2	0.3	0.4	0.5	0.8	0.9	1.0
Pigeon number.	1	2	3	4	5	6	7

Death of pigeon no. 3 gives an MLD of 0.4 milligram of venom and survival of pigeon no. 6 shows that 0.5 milligram of venom over the MLD has been neutralized by the serum. Similarly, death of pigeon no. 4 gives an MLD of 0.5 milligram and the survival of pigeon no. 7 shows that 0.5 milligram over the MLD has been neutralized by the serum.

The serum thus protects against 2 to 3 MLD only. This test has been in use in Kasauli for many years.

The concentrated serum is so diluted as to satisfy the same standard in one-fourth of the volume. It is issued in doses of 10 cc. which replace the former doses of 40 cc. of the unconcentrated serum.

The toxicity (if any, due to bacterial activity in the later part of the dialysis or any other cause) is tested by giving a rabbit 3 cc. of the serum intravenously.

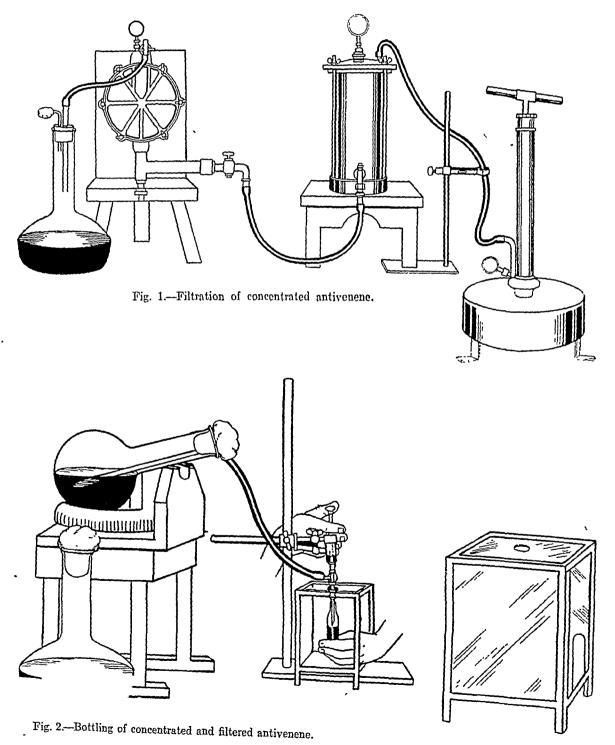
Filtration.—The filtration system is closed (see figure 1). The loss due to merely mechanical causes is minimized by washing all the empty containers with 18 per cent solution of ammonium sulphate and storing the washings. The filtering dises are also broken up and the protein from them extracted by washing the pulp. The washings are ultimately treated like the diluted plasma to which 18 per cent ammonium sulphate has been added.

Bottling.—The bottling system is also closed except at the point of delivery (see figure 2). A two-way syringe draws up 10 cc. of the product, at a time, from the flask and delivers them into the ampoule. The needle is protected from dust by a glass-case which is sterilized by dipping in cresol and wiped with a sterile towel. The adapter and the needle are fitted on the syringe with the aid of a sterile towel and secured in position by a piece of string. The

ordinary method of filling ampoules in a negative pressure is not applicable as wetting of the neck of the ampoule results in charring on sealing.

Any excess of the fluid on the needle is wiped off with a sterile swab dipped in trikresol.

Tests for sterility.—Samples for testing sterility are taken from the filling system at the commencement of the process, in the middle and at the end.



Loss of protecting units, protein content, etc.— The loss in protection units in concentration, calculated by estimating the protecting units in the unconcentrated plasma (taking the total quantity of the plasma for serum for the purpose) and in the finished product, was not found to exceed 20 per cent even in the early experimental stages of the work when small quantities were being concentrated. In later work at times it appeared as if there was no loss at all. This, of course, depends on the gaps in the quantities of the venom and the antivenene and the number of birds used. Even a loss of 20 per cent cannot be called excessive.

The protein content of the finished product is below 16 per cent and its viscosity about 6 times that of normal saline.

Observations on the Technique

The antiseptic.—0.7 per cent of a mixture of equal parts of trikresol and ether added to the plasma appears effectively to present putre-faction, in spite of dilution in the later stages of the dialysis when the protecting influence of the salt is removed. A distinct odour of the antiseptic is present in the cake. The writer has only once attempted, in hot weather, concentration of plasma to which no antiseptic had been added. The odour of the dialysate was suggestive of putrefaction.

The purity of ammonium sulphate.—So far salt of three different grades of purity from three different manufacturers has been used. There does not appear to be any difference in the product associated with the grade of purity. The salt should, of course, be free (reasonably)

from arsenic and iron.

Stored plasma.—After several weeks' storage the fibringen of the plasma loses the power of clotting quickly and firmly on the addition of calcium chloride. In dealing with such plasma a heavy white deposit is encountered in the dialysate during the two weeks' storage. Often a change of colour develops in the stored plasma. At times the stored plasma thickens uniformly like a soft jelly. No appreciable loss of potency has been found associated with any of these changes.

The colour of the product.—As has been mentioned, the colour of the product is slightly green. On two occasions batches of the product turned brown in the course of a night. No loss of potency or development of toxicity was associ-

ated with the change in colour.

Protein content, viscosity and potency.—No correlations were found between these three properties of the serum. The increase in potency of the unconcentrated serum may be associated with a quantitative or a qualitative change in the pseudoglobulin of the blood. Viscosity depends more on the amount of euglobulin retained in the product than the total protein content. In one batch of the product the viscosity was 12 times that of normal saline (instead of the usual figure 6) while the protein

content was only 16.6 per cent (instead of below 16 per cent). The viscosity decreases as the

euglobulin falls out of solution.

Obtaining serum from the plasma.—If it be desired to work with serum instead of with plasma, the latter is diluted with two volumes of tap-water and the usual amount of calcium chloride calculated for the undiluted plasma added. In six hours at room temperature a definite but soft clot forms. The clot is squeezed through muslin. The quantity of fibrin collected on the muslin is negligible and for all practical purposes the plasma is converted into serum (diluted with two volumes of water). The quantity of the antiseptic present is sufficient to prevent putrefaction. When the plasma has been stored for several weeks the time of clotting is prolonged and may extend to four or five days.

Two kinds of antisera.—In the antivenene the antibody is contained in the pseudoglobulin and is removed in the second precipitate. In antiorganism and antivirus sera the antibody is contained in the euglobulin and is removed in the first precipitate after serum has been obtained

from the plasma previously.

Electrophoresis

Concentration of antivenene is also effected by the passage of an electric current through the liquid held in a special container.

Refined Sera

These concentrated sera have also been subjected to the action of an enzyme which (i) reduces the quantity of the protein and (ii) alters the molecule. Such sera produce reactions only occasionally. Further, the reactions are almost invariably mild.

Small Samples of Normal Sera

Normal serum from the same species of animal which has provided the antiserum should be available for testing a subject for hypersensitiveness (see SERUM SICKNESS).

A Mirror of Hospital Practice

AN UNUSUAL CASE OF ACTINOMY-COSIS OF CHEEK*

By G. PANJA, M.B. (Cal.), D.Bact. (Lond.) (From the Department of Pathology and Bacteriology, School of Tropical Medicine, Calcutta)

THE disease occurred in a Hindu male, aged 36, and affected the left cheek over the malar prominence (figure 1, plate XXI). It was characterized by a reddish, painful swelling of six months' duration, about an inch in diameter with softening in the centre. On incision, pus

^{*}The paper was passed through the Editorial Committee and was read in the Indian Science Congress.

came out, which on examination showed fine whitish granules. In the granules, fine branching filaments without any clubs as well as bacillary and coccoid forms of organisms were seen (figure 2, plate XXI). No pyogenic microorganisms were found in the pus. An actinomyces, Gram-positive, non-acid-fast and nonsporing was isolated in pure culture ærobically on nutrient agar, blood and serum media, and no other micro-organisms. Growth was slow and in about 2 weeks a large elevated colony developed about 2 mm. in diameter with irregularly lobular margin and radially striated periphery. It liquefied Loeffler's serum. In a hanging drop preparation in serum broth, fine branching mycelial filaments, some tortuous, were seen (figure 2, plate XXI). Anærobically, growth was poor. The causative organism is undoubtedly an Actinomyces but cannot be identified with any known species.

This Actinomyces was not identifiable with the

following known pathogenic varieties:-

A. madura—bigger granule, copious growth on glucose or maltose agar, slightly reddish in colour and exclusively ærobic.

A. somaliensis—growth yellow coloured and

hard.

A. pelletieri—red granule and ruby-red culture.
A. ponecti—large granule, yellow coloured.

A. thibiergei—white granule of small size with or without clubs but grows both ærobically and anærobically with ease.

A. asteroides—acid-fast filaments.

A. bovis—strictly anærobic.

As the actinomyces isolated from this case does not possess characters of the above Actinomyces, it appears to be a new type.

The disease was confined to the skin only and had no connection with the adjacent teeth or the antrum. It improved with potassium iodide but was not cured completely. Relapse took place within 3 months. Finally, complete cure was obtained by scraping and x-ray exposure.

A DOUBLE-HEADED MONSTER

By D. N. GHOSH

District Medical Officer, O. T. Railway, Samastipur

A DOUBLE-HEADED monster was born in the Railway Hospital, Samastipur, on 5th July, 1948. It is an interesting case because of its rarity; the photograph (plate XXII) tells its own story. Dr. Mody, in his jurisprudence, gives a picture of such monster without any detail.

The woman was a sweeper by caste, second para, and fairly well built. She came to hospital in a precarious condition, having been in labour for five days. She was totally exhausted from protracted labour in spite of good health.

When she arrived in hospital, one of the heads was hanging down, and the other head and the body of the child were found on examination to be lying across the uterus which was so tonically contracted that a thorough examination was not possible till she was given chloroform. Twins

were suspected but not a double-headed monster. The child had died some time ago and was in a macerated condition.

She was delivered under deep anæsthesia by manipulation. Paudalie version was done and the other head was taken out by forceps. There was only one cord and one placenta. The woman made an uneventful recovery after

running a temperature for a few days.

The monster was fully developed. Both heads were covered with hair, and eyes, nose and ears were perfectly normal. It had two lower limbs and two upper limbs and its weight was about 7 lb. The chest was a little broader than usual. There was no line of fusion of two separate fectuses although this was the case. There was one common anus, behind which there were two dumples in one of which caudal prolongation persisted giving the impression of a tail.

Both male and female genital organs were present; the former being only rudimentary whereas the latter, being prominent, had the stamp of a female child (see photograph).

Such a freak of nature is not ordinarily seen. There is no doubt they were twins, fused together during development but the heads remained separate and one set of limbs either did not develop or remained buried in the body. The dissection would have revealed it and probably two hearts but as the specimen would have been spoilt, the course was given up.

Now the question arises whether such a child is capable of survival at all, when diagnosed early and delivered by Cæsarean, if necessary. In this case it could not be determined if there was any sign of life when the first head was

born.

A CASE OF *H. INFLUENZAE* MENINGITIS TREATED WITH PENICILLIN AND SULPHADIAZINE

By D. K. DUTTA, L.M.P., L.T.M.

R. C. BARUAH, L.M.P., L.T.M. C/o A. O. C. Hospital, Digboi

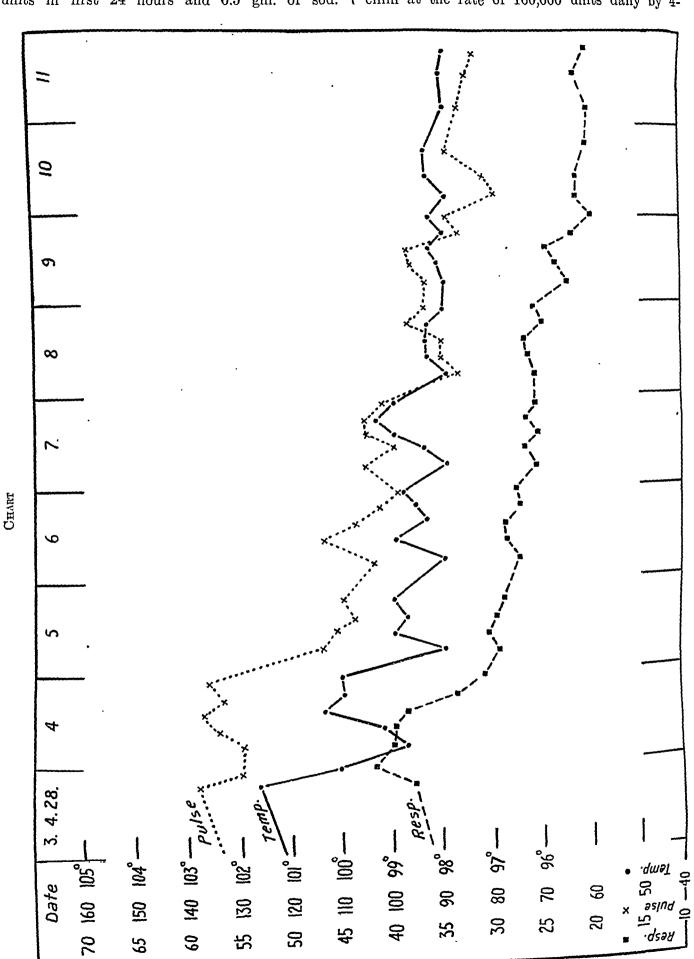
R. M., a male child, aged about $3\frac{1}{2}$ years, was brought to A. O. C. Hospital on 12th April, 1948, at 11 a.m., with fever of 18 hours' duration. He was one of the four children in the family, who were suffering from catarrhal infection. On admission, the child was listless and apathetic. The neck was rigid and retracted. Kernig's sign ++; after a while he started having convulsions. Temperature was 101°F.; pulse 136; respiration 38. Tonsils were slightly enlarged and congested. Liver, spleen, lungs and heart normal. Blood for M.P.—ve (thrice). Total W.B.C. were 7,800 per c.m.—with polymorphs 59 per cent. lymphogytos 25.

per cent, lymphocytes 35 per cent and large mononuclears 6 per cent. On lumbar puncture, C.S.F. was under moderate pressure, apparently clear to the naked eye, globulin contents slightly increased. Indol test was positive and on culturing the fluid in chocolate agar media H. influenzæ

grew after 48 hours.

Treatment.—Penicillin, 10,000 units, was given intrathecally, immediately followed by intramuscular penicillin 4-hourly to a total of 125,000 units in first 24 hours and 0.5 gm. of sod.

sulphadiazine intravenously with 15 cc. of 25 per cent glucose solution followed by 0.5 gm. every four hours orally. Intramuscular penicillin at the rate of 100,000 units daily by 4-



hourly injections and sulphadiazine orally were continued for 5 days till the temperature was completely normal. Convulsions stopped after twelve hours: stiffness and retraction began to improve after 48 hours and by 4th day it disappeared completely and child started taking interest in its surroundings and became playful. Temperature, pulse and respiration charts are given on the previous page.

Conclusion.—The sensitiveness of various strains of H. influenza to penicillin and sulphadiazine is very variable. It was not possible to type the organisms in this case, but it seems that the particular strain was highly sensitive to penicillin and sulphadiazine. The strain appears to be quite unlike the strains investigated and reported by other observers. One of the most comprehensive accounts was given by E. N. Allatt, pathologist, Lewsham Group Laboratory, in the British Medical Journal, dated 2nd August, 1947. In his case note on bacteriology in testing the penicillin sensitivity in his laboratory carried out by punch plate method, he wrote 'It is impossible to give an exact figure for concentration of penicillin required for inhibition of H. influenzæ but it is probably more than 10 and less than 100 times as much as which inhibits the staphylococcus'.

Our thanks are due to Dr. A. S. Prowse, M.B. (Lond.), C.M.O., Assam Oil Company, Digboi, for kindly permitting us to publish this case note.

A CASE OF COMPLETE DETACHMENT OF THE HEART

By P. S. KHOSLA, M.B., BS., LD.S., D.M.R.E.

Medical Superintendent, S. M. G. S. Hospital, Jammu,

Kashmir

A Hindu female, aged about 60 years, was run over by a military truck, as a result of which she died instantaneously. The dead body was brought to the hospital for post-mortem examination by the police. On examination, a few abrasions were found on the left side of the face and dorsum of the left hand. There was a contused wound on the right side of the scalp. The nostrils contained clotted blood. The tongue was forced between the teeth. Beyond these injuries there were no other external marks of violence. On examination of the skull, no fracture of the vault or of the base, or any injury to the brain or its coverings was detected.

On reflection of the soft parts over the chest the fatty tissue over the middle of the sternum was found to be infiltrated with blood. There was a transverse fracture of the body of the sternum. Upper five ribs (from 2nd to 7th) on either side were found fractured along the nipple line. On opening up the chest both the pleural cavities were found to be filled with fluid blood. The right lung was adherent at the base. On putting the hand in the left pleural cavity to find out the condition of the lung as regards adhesions, etc., a globular mass, lying free in the cavity, was detected. On examination, this was found to be the heart that had become detached from its vascular attachments.

On examination of the pericardium, a rent on the left side parallel to the vertebral column and about three inches in length was detected.

The examination of the rest of the body revealed no other injury or sign of disease.

During my over twenty years' experience of medicolegal work this is the first case of its kind that I have come across. Rupture, spontaneous or through injury, of the ventricles or of the big vessels, has been mentioned in the books specially of Taylor, Lyons and Modi, but no mention of such an injury as described above has been made. In Legal Medicine and Toxicology' by Gonzales and Vance, amongst five kinds of injuries to the heart, mention is made of its being torn from its attachments. An illustration is given of a case where a 4-yearold child, run over by motor truck, had sustained such injury. However, in this case the heart was held to its attachment by a slip of vena cava and no mention of any injury to the pericardium is made.

The mechanism in the particular case cited above appears to be compression that was possibly more on the right side of the chest burst the pericardium on the left side and the same force dragged the mobile part of the heart downwards and to the left, separating it from its attachments and forcing it into the left pleural cavity through the rent in the pericardium.

GENECULATE HERPES OR 'R'AMSAY HUNT SYNDROME'

By D. K. DUTTA, L.M.P., L.T.M.
A. O. C. Hospital, Digboi P. O. (Assam)

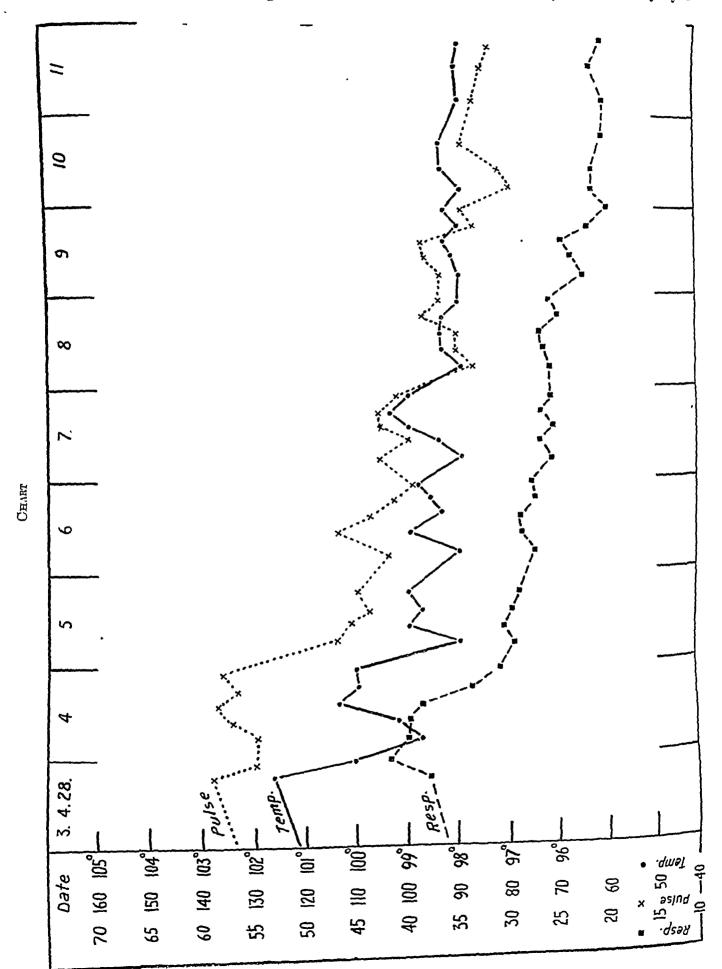
A Sikh male, aged 53 years, reported to the clinic with vesicular eruptions on the right side of the face, right ear, post-auricular, occipital, auriculo-temporal region and in the nose accompanied with facial paralysis. Pain was complained of over the whole of the affected area but very excruciating inside the ear: temperature 99.6°F. The case was treated like herpes zoster with pituitrin and took 8 weeks

for complete recovery.

Though herpes is a lesion of posterior root ganglion occurring in the distribution of cutaneous nerve-segment depending on the affected ganglion, facial paralysis accompanies herpes when only the geneculate ganglion of the 7th nerve is affected. This is why it is called geneculate herpes. But from the wide area involved in the above case it seems that other nerves were also equally involved. As for instance lesion on face is due to involvement of gasserian ganglion, pain caused by lesion of tympanic plexus, vesicles in nose by nasal branches of sphenopalatine ganglion, that on neck due to involvement of the posterior root ganglia of C2 and C3. The conception of geneculate herpes which Ramsay Hunt originally produced before the American Neurological Association in 1905 comprises not only what has been observed in this case but also

Treatment.—Penicillin, 10,000 units, was given intrathecally, immediately followed by intramuscular penicillin 4-hourly to a total of 125,000 units in first 24 hours and 0.5 gm. of sod.

sulphadiazine intravenously with 15 cc. of 25 per cent glucose solution followed by 0.5 gm. every four hours orally. Intramuscular penicillin at the rate of 100,000 units daily by 4-



Therapeutic Notes

NOTES ON SOME REMEDIES

XXIII.-BLOOD TRANSFUSION, Part II

By R. N. CHAUDHURI, M.B. (Cal.), M.R.C.P. (Edin.), T.D.D. (Wales)

Professor of Tropical Medicine, School of Tropical Medicine, Calcutta

Transfusion in Special Cases

1. Hæmorrhage and shock

As the essential cause of shock in acute hæmorrhage is the resulting low blood volume, the restoration of blood volume by transfusion is the most important step in treatment. Intravenous saline or glucose-saline infusions are inadequate as their effect is only transitory, although they are a valuable supplementary when dehydration complicates the picture. Definite indications for transfusion are a rapid pulse and a systolic blood pressure below 90 mm. Hg. The usual signs-pallor, sweating, collapsed veins -are also important. But in shock clinical signs may be deceptive and in early stage the systolic pressure may be high even after considerable blood loss; such a patient without a preliminary transfusion may collapse during operation. Therefore, more reliance should be placed on the extent of blood loss and nature of the injury, and if these have been severe, transfusion should be given not only before operation but during and probably even after it. If the injury is not severe and the blood pressure is 100 mm. or over, transfusion may be delayed until response to general measures is observed.

In urgent cases the fluid is given rapidly at first—about one pint in 15 to 30 minutes and then the flow is reduced to a drip (30 drops per minute is equivalent to about 100 cc. per hour). This rate is kept up, the aim being to obtain a normal blood pressure and a pulse of good volume which in an average case is obtained with 2 pints of blood. When there is dehydration, some glucose saline may be added to the transfusion before taking the patient for operation.

The patient may fail to respond or the response may be sluggish. A danger signal is that the blood pressure has risen to normal or above normal, but the pulse is fast. In such cases fresh bleeding or some other complication may be suspected, and instead of persisting with the resuscitative measure, it may be wise to do an early operation if the patient appears otherwise fit for surgery.

The relative values of blood and plasma in hamorrhagic shock have not yet been finally decided, but when blood loss is the major factor in the production of shock, surgeons prefer blood for replacement. There is no doubt that operation is better borne if sufficient blood

be administered to keep the hæmoglobin above 70 per cent (Whitby and Britton, 1946). For moderate loss plasma or serum is sufficient. One advantage these substitutes possess is that as they do not cause hæmolytic reaction, transfusion can be started with them while blood tests are being carried out.

Finally, transfusion should not be allowed to overshadow the importance of general measures

to combat shock.

2. Burns

A special feature of burns is the loss of plasma that takes place from the blood stream into the tissues of the burnt area as well as externally from the surface of the burn and which in severe cases may amount to several litres. This loss occurs most rapidly during the first 20 to 30 hours but may continue until the third day. As a result there is reduction in blood volume with concentration of the cellular elements (hæmoconcentration) which is proportionate to the extent of the burn and which in a severe case is associated with what is called 'burns shock'. The hæmoconcentration can be influenced by early transfusion. Its degree can be judged by certain blood examinations (e.g. hæmoglobin estimation) but the best guide to transfusion is the extent and severity of the burn. Blood pressure readings within three hours of burning are of no value as at this stage in the majority of cases the blood pressure is within normal limits.

When hæmoconcentration is present, plasma or serum is preferable as transfusion of whole blood tends to increase the embarrassment of the circulation. Gibson and Brown (1944) found dried serum more satisfactory in burns than plasma which in their experience though as good caused a higher incidence of reactions. They also recommended that adults with burns of over 15 per cent of the body surface and children with burns of over 5 to 10 per cent of the body surface should be given transfusion, whether evidence of shock is present or not.

Burned areas are calculated as follows:-

Percentage	Thighs Legs Feet	 	ercentage 19 13 6
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Transfusion should be given early before irreversible changes have taken place in the tissues and in sufficient quantity to allow for the leakage of the fluid through the damaged capillaries. The amount to be transfused can be assessed only by repeated blood examinations (red cell count, hæmatocrit or hæmoglobin levels). In their absence the blood pressure and pulse rate may be used as criteria but are much less reliable. The size of the patient and extent of the burn may also be helpful. Owing to great

involvements of cochlear and vestibular divisions of 8th nerve, causing deafness, tinnitus, vertigo, vomiting, imbalance, etc., and herpes of tongue, palate, etc., in some cases. This shows the wide range of variation of nervous lesion in this disease for which Denny Brown rightly suggested that it may conveniently be described as 'The Ramsay Hunt Syndrome', until a better term than geneculate herpes is forthcoming, based upon exact knowledge of morbid anatomy.

TWO CASES OF TROPICAL EOSINO-PHILIA IN TEA ESTATE PRACTICE

By S. B. SINHA, L.M.F., D.T.M.

Assistant Medical Officer, Central Hospital, Hasimara

Tea Estate, Duars

A MALE tea garden labourer, aged 36 years, occupation chowkidar, was admitted in the Central Hospital on 25th May, 1948, from a neighbouring garden for the following chief complaints: (i) Irritating cough, (ii) irregular rise of temperature, (iii) loss of weight, and (iv) emaciation. Duration of illness—4 months.

Previous history.—An attack of similar illness 2½ years back which gradually improved on

symptomatic treatment.

Present history.—A detailed history is not easily available from this class of labourers: he had been suffering from irritating cough which was persistent and exacerbated at times with occasional rise of temperature and nocturnal dyspnea. History of hemoptysis on one or two occasions is also available.

On examination.—The patient was well built but emaciated and slightly anemic. Temperature was 99°F., pulse 90, respiration 20, appetite poor, spleen palpable, gland not enlarged, cough dry and hacking in nature. Inspiratory dyspnea was more marked at night. He also complained of substernal pain.

On auscultation.—A good number of rhonchi and medium râles were heard at the bases of

the lungs.

Blood showed no malarial parasites. Sputum—Repeated examination revealed no acid-fast

bacilli.

Skiagram of the chest could not be taken but it was thought that the case might be one of tropical eosinophilia and as such total and differential counts were done with the following results: Differential count—Neutrophiles 16 per cent, lymphocytes 13 per cent, monocytes 1 per cent, eosinophiles 70 per cent. Total W.B.C. count 32,000 per c.mm.

Stool showed no helminthic ova: W.R. could not be done. No other cause of such high

rise of eosinophiles was apparent.

The case was provisionally diagnosed as

tropical eosinophilia.

Treatment.—A sedative cough mixture was prescribed and acetylarsan 3 cc. was given every 4th day on 6 occasions. The patient felt better after the 2nd injection except that he had

an exacerbation of symptoms due to exposure to cold while out of the ward on a few hours' leave: otherwise he was free from symptoms after the 3rd injection and was completely cured. He became cheerful, gained in weight and was discharged on 24th June. W.B.C. count at that time was 8,000 per c.mm. Differential count—Neutrophiles 35 per cent, lymphocytes 25 per cent, monocytes 2 per cent, eosinophiles 38 per cent.

2nd case.—A female labourer, aged 40 years, from the same garden was admitted on 10th June, 1948, for the following complaints: (i) Evening rise of temperature, (ii) dry hacking cough, (iii) emaciation, and (iv) dyspnæa at

night. Duration—5 months.

On investigation.—Temperature 99.2°F., pulse 86, respiration 20, spleen not palpable. In the lungs were heard a few rhonchi and many râles at the bases. Sputum—No acid-fast bacilli. M.P. not found. Differential count—Neutrophiles 28 per cent, lymphocytes 23 per cent, monocytes 1 per cent, eosinophiles 48 per cent. Total W.B.C. 10,000 per c.mm. Stool showed a few ova of ascaris and hookworm. The case was provisionally diagnosed as tropical eosinophilia and responded dramatically even after a single injection of acetylarsan 3 cc. She was discharged at her own request after the 3rd injection to continue the treatment in the garden dispensary.

Although a thorough investigation was not possible, these cases could be safely diagnosed as tropical eosinophilia owing to signs and symptoms suggestive of pulmonary tuberculosis, absence of acid-fast bacilli in sputum and high eosinophile count. Löffler syndrome* could be excluded by its transient character, rapid and spontaneous recovery in contrast to the chronic nature of tropical eosinophilia and dramatic

response to arsenic.

Comments.—In this connection it may be pointed out here that quite often these cases are not correctly diagnosed due to lack of proper facilities for investigation in mofussil places and stamped as pulmonary tuberculosis or bronchial asthma and treated as such for a long time without beneficial results, when the disease, if properly diagnosed, is so rapidly amenable to simple treatment.

I am indebted to my chief Dr. A. B. Mitra, M.B., for his valuable suggestions in conducting the cases and kind permission to publish this note and also thankful to Dr. S. Chakravarty, D.T.M., for his laboratory investigations.

*'It is uncertain at present whether tropical eosinophilia or the eosinophilic lung is the same condition as Löffler syndrome.'—Editor, I.M.G.

ERRATUM UNWANTED MEDICAL RELIEF

By S. D. S. GREVAL

LIEUTENANT-COLONEL, late I.M.S.

(Serologist to the Government of India, School of Tropical Medicine, Calcutta)

In the above article published in the Indian Med. Gaz., 83, page 323, column 2, last but one para, line 5, for "injured 'murdered'," read "injured, 'murdered',".

blocking of the lymphatics may make it impossible for the filarial embryos to reach the

general circulation.

Here is an analysis of 133 cases of clinical filariasis, in which careful night-blood examinations were carried out. This ought to give the practising doctors an insight into the laboratory possibilities in filariasis. In a total of 87, more or less advanced elephantiasis of trunks or scrotums, microfilaria was seen only once. In 46 cases of acute lymphangitis or elephantoid fevers, including varicose glands, funiculitis, and in a few instances chyluria, the microfilariæ were present 31 times, patients with chyluria, more readily showing microfilariæ in their blood, often in abundance.

Mention may be made here of an intradermal test for filariasis, introduced by Fairley, with an antigen made of Dirofilaria of the dog. A serological test also is possible with the same antigen. The names of Taliaferro and Hoffman are to be associated with these tests.

Life history of W. bancrofti

Some noteworthy aspects of the life history of Wuchereria bancrofti may be recounted here with advantage. Microfilariæ, about 1/90 inch long, are born within the definite host (man) and the term simply indicates the first stage of their embryonic existence. Unless sucked up by the intermediary host (mosquito), the microfilariæ must perish inside the definite host, incapable of further development or harmful

parasitism. Once the microfilariæ reach the stomach of the mosquito, things shape intelligently and rapidly. Within a few hours of their arrival there the microfilariæ aided, perhaps, by the viscosity of the fluid, manage to wriggle out of their tubular sheath and become so many free 'larvæ', now capable of action! They quickly pass through tissues and reach the thoracic muscles of the mosquito, which they make their temporary home. Here they undergo the necessary metamorphosis, taking about 11 to 3 weeks, depending upon the atmospheric temperature to complete the cycle without which Nature does not fit them to re-enter a definite host, their future permanent home! The 'larval filariæ' (no longer microfilariæ), now ready and anxious to enter a warm-blooded animal, reach the base of the proboscis of the mosquito, some actually passing into it. At the next feed of the insect one or more of these fully developed larvæ now about 1/18 inch in length penetrate the thin membrane at the tip of the proboscis and reach the surface of the skin of the human host which they bore through, and the unfortunate person becomes filariated, perhaps, for the rest of his or her life! It is roughly estimated that it might take 6 months or more for these larvæ to become sexually mature adults and produce microfilariæ.

Sucking in, a large number of microfilariæ from a heavily infected person may kill the mosquito concerned; for, the injuries likely to be inflicted by these actively boring larval forms in the course of their metamorphosis may become too extensive for the tiny intermediary host. From an infective point of view, therefore, a person exhibiting only a few microfilariæ in the blood is more dangerous to the community than one who is swarming with them.

Incidentally, formerly it was thought that the mosquito, carrying larval filariæ, sometimes went and died in the water and the larvæ escaping into it, infected the human host directly from the water. Has anybody conclusively proved that this could not happen? The popular belief strongly is, that it does. Of course, there is nothing scientifically against a mosquito armed with fully formed larval parasites dying in a shallow well or even in a pot of domestic water supply from which the life history of the mosquito is inseparable. Two questions arise: How long can the larval worms remain active in ordinary water? Will they fare better, if the water is saltish?

Treatment

A specific drug to cure filariasis has not yet been known and it is extremely doubtful whether a satisfactory 'drug discovery' in this direction is ever going to be an accomplished fact. My reason for making this gloomy statement is that the causative agent in this case is not an ordinary toxin-producing micro-organism; but a worm of considerable bulk which remains in the narrow confines of the lymphatics of man, alive or dead, an ever dangerous foreign body. That being so, a therapeutic discovery, to be of any value, must be a drug to expel or otherwise remove the nematode from the lymphatics and not to kill them in situ, as a dead and calcified filaria in the system may prove even more troublesome than a live one.

The Filaria bancrofti causes roughly two types of trouble. One is lymphatic varix of different kind and the other, tropical elephantiasis—the incurable solid ædema. In the first variety of cases the microfilariæ are generally present in the blood of the patient and in elephantiasis they are almost always absent, the simplest and the most accepted explanation being that in many instances the offending adult filariæ have died. The treatment of elephantiasis, therefore, is surgical. A number of operations have been suggested. Auchincloss's operation is particularly interesting because he aims at finding, possibly by means of x-ray, and removing calcified filariæ from their tombs, along with chunks of unhealthy tissues. A good deal, of course, can be done, palliatively, to reduce the tension and swelling with proper bandaging and by keeping the leg elevated. Prolonged use of a snugly applied elastic support in the early stages of the disease may keep the lymphædema under control.

In cases of filarial lymphangitis including painful glands, funiculitis, cellulitis abscess, chyluria, etc., associated with rigor and fever, 'sulpha' drugs are the remedy of choice. I have found the results obtained invariably good as a palliative measure. I have also tried penicillin in a few cases with gratifying results. This is, as it ought to be, in view of the widely accepted theory that the febrile attacks in filarial affections are due to the secondary invasion of streptococcus or staphylococcus into the tissues damaged by the filarial occupation. The possibility of a filarial toxin has also been suggested.

While on the subject of the treatment of filariasis, one cannot help making disagreeable remarks about some of the filarial 'specifics' manufactured and used in this country. A small quantity of arsenic dissolved in a little typhoid vaccine, often of doubtful potency, is still a seriously thought of remedy here! Whatever might have been the justification for employing that sort of thing in the past, to-day it would be honesty to stop making them, much more, stop using them! If the small doses of arsenic incorporated in these little ampoules are expected to kill the adult filaria, it is just as well to squirt syringefuls of it into the ocean, in the hope of destroying the deep-sea monsters!

Antimony, perhaps, is the one drug that may be used with some justification as a curative measure. But it must be realized, however, that never in the field of human medicine was so much used by so many with so little achievement as antimony in filariasis! O'Conner found it not good enough to kill filariæ of the Western Pacific. Leiper, after his experience in British Guiana, thought it was only of limited value. Fulleborn observed that the intravenous injections of antimony were not at all successful in Onchocerca infection, the blinding filariasis of Guatemala. He always found the parasites in the nodules living when excised later. I have given intravenous injections of tartar emetic, running into thousands and cured hundreds of cases of bilharziasis, both B. hæmatobium and mansoni, in Africa. But it has never been able to make an impression upon my mind as a filarial remedy of any real value, the toxicity of the drug sometimes seriously hurting the patient before it did anything at all to the parasites.

Despite these adverse reports, no less a person than Sir Leonard Rogers believes that an intensive course of antimony will destroy Filaria bancrofti and that the drug is worthy of a new trial. The only hope here is that this great investigator and physician never says anything without good reason! He recommends, to be sufficiently intensive, two daily injections. This, of course, can only be done in a hospital where the patient could be carefully watched for toxic symptoms. At a recent trial with antimony, carried out at Porto Rico Medical School, 'Neostibosan' was found to be effective and the least toxic. Some of the antimony stuff now available in the Indian market may be found to

be equally satisfactory. Mention may be made of Brahmachari's Neo-stilbene in this connection.

The junior practitioners with limited experience in the treatment of filariasis may find the

following suggestions helpful:

Filariasis is a preventable disease. If there are no mosquitoes, the infection becomes an impossibility. For this reason, if the patient is in an endemic area, he must be induced to sleep under a mosquito-curtain. Better still for him is to go away from the endemic area. A sufferer with microfilariæ in his blood is as much in danger himself (a second infection) as are his neighbours.

Never start treating a case with antimony on mere suspicion. As a rule, such necessarily long and tedious curative treatments had better be reserved for cases in which microfilariæ can be demonstrated in the blood of the patient, as the only way of determining the progress of the treatment is by periodical counting of microfilariæ in a measured quantity of blood as the treatment goes on.

A microscope is essential for this class of work. If the doctor has not got a 'Lab' of his own. he should, in fairness to his patients, remain attached to one. He must be able to take a decent thick film, blood-slide which can be done almost to perfection with a little practice. A clean slide, a straight surgical needle and a clean finger-tip are all that is necessary. Gently stab the finger-tip and by slight pressure drop on to the slide 3 or 4 drops of blood. Now spread the blood, using the same needle for the purpose, so as to form a thick film covering roughly the middle third of the slide, and leave it to dry. This smear can be dehæmoglobinized and stained at the same time by placing the slide, film upward, in a weak watery solution of fuchsin or methylene blue. The lightly stained microfilariæ may be seen easily with a low-power lens in the plasma, which remain on the slide, red cells becoming invisible in the process of staining.

An ordinary, wet, cover-glass preparation of filariated blood, if examined directly after taking it, will show microfilariæ actively wriggling among the corpuscles.

When dealing with Wuchereria bancrofti, in places where the introducing mosquito is a night-biting one, the nocturnal periodicity becomes an important factor. The largest number of microfilariæ seem to appear in the peripheral blood of the patient at about midnight. The best time, therefore, to take blood for examinations in such cases would be after 10 p.m. This does not, however, mean that microfilariæ will never be found in the blood earlier or during the day. I have seen them at such times often, but they are scanty.

Filariasis, fortunately, is a readily preventable malady. If preventable, why not prevent it? Just now, a very urgent question for the State to tackle.

In the fight against Malaria OUININE

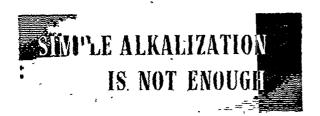
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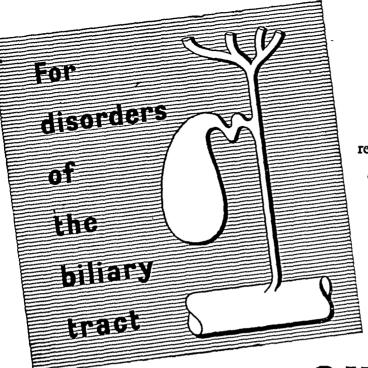
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Indian Medical Gazette

SEPTEMBER

THE SHORTAGE OF FOOD AND CLOTH

Ir is usual to refer to the food shortage as a world shortage. This is not really correct. In the southern hemisphere and in North America there is no shortage of food. The shortage is afflicting the people of Europe and Asia only.

'The most important single factor in the recent world food shortage is the grain crop lost in Europe' (from Day to Day, 1948).

'Production in the Middle and Far East is still below pre-war level and indeed the only countries to show increase are those in the southern hemisphere' (from Day to Day, loc. cit.). With due deference to official pronouncements on the subject, here and elsewhere, it may be added that so far as we are concerned the shortage is largely man-made. Hoarding and cornering are with us ancient institutions. Before the two world wars, however, they were the monopoly of only a few experienced hoarders and corner men. In a purely agricultural province like the Punjab of pre-world war I one saw the operations of these experts. The food grains were either 'sold' (to the exporters mostly European) or 'laid by'. In the latter move there was a risk. The storage conditions being far from perfect insects occasionally destroyed the entire stock. Many novices of means were ruined every year. The unusual prosperity of a farmer was always traceable to the 'loot from China' brought by one of his soldier progenitors, and the ruin of a trader to the insects in the food grain 'laid by'. When the stocks were destroyed there was, of course, a loss of the food grain to the country apart from the ruin of the hoarder. On the whole this loss was small.

Two World Wars have increased the number of hoarders and corner men: this has increased prices. The storage conditions have not been much improved: this has increased the loss to the country.

The production itself is below par because: (1) The labour which the war effort brought to towns is still idling in towns. Because of the higher wages even in idling the labourer makes enough by occasional periods of work. Industrialization and rumours of industrialization are in the air. The workers come to town to work and to strike: they are lost to agriculture. This problem is for the economist to solve. The farm does not pay cash like the factory. (3) There are camp-followers in industry. They supply utility services and domestic service in towns to reach which they have to leave their

province as often as not. They are also lost to

agriculture.

The domestic service appears to interfere with food seriously. History of Calcutta provides a perfect example. In 1748-1767 domestic servants flocked to Calcutta and by a combination of working and stopping work made the wages rise, so much so that it became necessary for the authorities to pass the following resolution:

Taking into consideration the united complaints of the inhabitants (of Calcutta) with respect not only to the insolence but exorbitant wages exacted by the menial servants, and having duly weighed and considered the premises, we are of opinion that their complaints are too justly founded and loudly call for redress. That a rate of monthly wages be established according to the underwritten lists of servants in private service (Old Tales Retold, 1947).

Then came the scarcity of food. The authorities had to pass another resolution:

The scarcity of grain in the place (Calcutta) being at present such as to distress the poorer sort of people in the greatest degree, in order therefore to relieve the wants of the poor, the Board propose sending a sum of money to the markets in the country for the purchase of a quantity to be sold at an easy rate (Old Tales Retold, loc. cit.).

All those that force wages do not get them. Quite a large number of them die in towns because of sheer discomfort. In the outbreak of plague in Calcutta in 1948 all those that died in the Infectious Diseases Hospital, Calcutta, were non-Bengalee camp-followers of industry (Editorial, 1948a). The dead are, of course, lost to agriculture. Greed brings them from the open countryside to the insanitary slums of towns to suffer, sicken and die.

Agencies interested in spreading discontent after the war and before the transfer of power displayed prominently figures showing 400 per cent increase in the prices of commodities and pampered the lower classes. All of them ignored the difference between the cost of commodities and the cost of living. The latter never rises like the former. As a matter of fact, taken all round, the lower classes have not been so well off within living memory as they are to-day.

The shortage of cloth in our country is altogether man-made. The industry has let down both the Government and the people. Such is the considered opinion of our leaders. The explanation that the increase in the buying power of the rural population has raised prices of commodities in general will not find favour with anyone other than the industrialists concerned.

We are interested in these extraneous topics because they are creating a country-wide want, and the problems of want are the problems of health. Besides, our professional brethren are taking their places at the helm of the ship of the State (Editorial, 1948b). There is no reason why we should not expand our horizon and view the problems of the State, likewise.

REFERENCES

DAY TO DAY (1948) .. The Medical Press, 12th May, p. 414.

EDITORIAL (1948a) .. Indian Med. Gaz., 83, 137.

Idem (1948b) .. Ibid., 83, 235.

OLD TALES RETOLD WITH Ibid., 82, 571.

FRESH COMMENTS (1947).

ERRATUM

In the editorial on 'The Tragedy of Tragedies' published in the *Indian Med. Gaz.*, 83, page 332, column 1, last para, line 2, for 'The world had been' read 'The world has been'.

Medical News

THE TWELFTH BRITISH CONGRESS OF OBSTETRICS AND GYNÆCOLOGY

JULY 1949

To be held in the Friends Meeting House, Euston Road, London

Preliminary Notice

President: Sir Eardley Holland. Hon. Secs.: A. Joseph Wrigley and Ian Jackson. 58, Queen Anne Street (Royal College of Obstetricians and Gynæcologists), London, W.1.

WEDNESDAY, 6th July.

Morning Session. 10.0 a.m. (Chairman: The President.)

The Congress will be declared open by the Minister of Health.

'Modern Cæsarean Section'. Introduced by Mr. McIntosh Marshall (Liverpool).

Afternoon Session. 2.0 p.m.

- (1) Guest Paper. Dr. Joe Meigs (Massachusetts).
- (2) 'Pregnanediol'. Introduced by Prof. C. F. Marrian (Edinburgh) and Dr. G. I. M. Swyer (London).

THURSDAY, 7th July.

Morning Session. 10.0 a.m.

'Essential Hypertension in Pregnancy'. Introduced by Prof. George Pickering (London) and Prof. F. J. Browne (London).

Afternoon Session. 2.0 p.m.

- (1) 'Hernia of Pouch of Douglas'. Introduced by Mr. Charles Read (London).
- (2) 'The Management of Pregnancy in Diabetics'. Introduced by Mr. John Peel (London) and Prof. D. M. Dunlop (Edinburgh).

FRIDAY, 8th July.

Morning Session. 10.0 a.m.

'Diagnosis and Prognosis of Carcinoma of the Uterus'. Introduced by Dr. J. E. Ayre (Montreal) and Dr. Spears (Cambridge).

Afternoon Session. 2.0 p.m.

Discussion on Maternal Mortality.

Owing to the difficulties that exist at the present time in arranging hotel accommodation, travel, etc., the Hon. Secretaries would like to have the names of

those who hope to attend by 31st March, 1949, at the latest, and, if possible, very much before that date.

AUSTRALIA TACKLES TUBERCULOSIS . 20-YEAR ERADICATION PLAN By NORMAN BARTLETT

(From Release No. P./924, offered by the Public Relations Officer, Australian High Commissioner's Office, New Delhi)

THE Australian Federal Government plans to spend Rs. 40,00,00,000 over the next 20 years in an effort to reduce tuberculosis to a problem of minor importance. In Melbourne recently (29-30 June) the Federal Health Minister, Senator Nicholas E. McKenna, met State Health Ministers to discuss preliminaries for launching an Australia-wide campaign.

The Australian tuberculosis death rate of 33 per 100,000 inhabitants compares favourably with other countries. In 1945, for instance, the New Zealand figure was 38 per 100,000 inhabitants, the United States of America, 40, England and Wales, 56, Scotland, 74, the Netherlands, 86, France, 106 and Finland, 157.

The Federal Director of Tuberculosis, Dr. Harry W. Wunderly, believes that under Australian conditions the disease can be controlled still further and eventually reduced to a minor diseases category in its public incidence. In a recent survey Dr. Wunderly found that between 30,000 and 40,000 Australians suffer from tuberculosis, in a total population of 7,580,820.

At the conference, Ministers agreed to recommend that the State Governments appoint full-time Directors of tuberculosis, establish case registers to provide central, complete and easily accessible records of vital facts relating to tuberculosis patients and contacts and introduce legislation making notification of tuberculosis compulsory on bacteriological evidence or on 'reasonable evidence'. 'Reasonable evidence' is taken to mean clinical condition supported by radiological evidence.

Compulsory X-Rays Rejected

Ministers disagreed about the need for compulsory x-ray examination to detect the presence of tuberculosis. They decided to maintain the present system of voluntary examination coupled with public health campaigns. They agreed, however, to ask the Federal Government to draw up a draft bill for submission to State Governments embodying the requirements for a general compulsory examination 'in appropriate cases and at appropriate times'.

'Health Ministers will be open to criticism if they fail to face up to the need for compulsory x-ray

examination', Senator McKenna warned the conference. 'An educational campaign will make the people realize how necessary is the need for examination.'

'All infectious cases must be located regardless of bed shortage', declared Dr. Wunderly in a report, which was the basis of conference discussion. 'Epidemiologists claim that it is necessary to survey at least 80 per cent of the population aged over 15 years within a short time if tuberculosis is to be controlled quickly. With the present shortage of trained staff and suitable equipment it is essential, however, to limit case-finding surveys, in the first instance, to those areas and industries in which the incidence of tuberculosis is already known to be high'.

Dr. Wunderly recommended that a start should be made with the following: (1) the populations of capital cities and suburbs; (2) working miners; (3) food handlers; (4) employees in big industrial concerns; (5) students in high schools, technical schools and universities; (6) school teachers and university staffs; (7) employees in public utilities such as railways and tramways; (8) members of the public service; (9) all patients attending ante-natal clinics.

Nation-wide Survey

The present campaign is the culmination of 20 years' work by Australia's Federal Health Council and National Health and Medical Research Council. These bodies have repeatedly urged the need for increased accommodation, for liaison between clinics, sanatoria, preventoria and industrial colonies, for better nutrition and improved environmental conditions for patients and contacts and for special precautions for those exposed to special hazards, such as nurses.

Last year Dr. Wunderly, newly-appointed Federal Director of Tuberculosis, made an Australia-wide survey of existing facilities for the control of tuberculosis. He discovered a complete lack of uniformity between the States in their plans for tuberculosis control. There was, he said, a shortage of trained specialists, medical officers and nurses, an unconomical use of beds, a shortage of sanatoria, thoracic wings and chalets and a lack of properly organized radiographic units.

Despite shortages and interruptions caused by the war, Dr. Wunderly found a widespread desire to do something practical about tuberculosis. There was also considerable unco-ordinated activity by some State Departments, municipal councils and anti-tuberculosis organizations. He hopes to co-ordinate all this scattered effort and gear it up for a planned all-out drive with Federal financial backing.

Within a few years Dr. Wunderly hopes to see at least 20 mobile or transportable x-ray units operating throughout Australia besides many additional permanent chest clinics in thickly populated areas. A radiographer, a nurse and a record clerk, all specially selected and trained, will accompany each portable and mobile unit.

Tests of Aboriginals

Dr. Wunderly foresecs the eventual need for a case-finding survey among Australian aborigines and the native peoples of the Torres Straits and New Guinea. In Western Australia, a Mantoux test has been made already. A large percentage of the natives tested showed a positive reaction.

Before the campaign is over, Dr. Wunderly hopes to see a transportable unit with its own generating plant on a trailer operating in the rugged back country of Australia's tropical north. He sees, however, many technical difficulties to be overcome before a survey of New Guinea is possible. Not the least of these difficulties will be the processing of films under tropical out-back conditions.

Besides adequate financial protection for patients and their dependants, Dr. Wunderly recommends careful rehabilitation and after-care. 'This part of the plan is extremely important', he says. 'It is in every way

uneconomical to restore a patient to useful citizenship and then let him break down again. Vocational training should commence at the beginning of residence in the sanatorium and continue right through to discharge. There must be constant supervision of patients and discharged patients. Care must be taken to see that they are re-examined at regular intervals arranged by the responsible medical authority. The follow-up of discharged patients should continue till they have been bacteriologically negative for tubercle bacilli for three years. The testing should be done at least annually for three years.

Dr. Wunderly, who comes from Adelaide, has been an active anti-tuberculosis fighter for many years. He and Mrs. Wunderly recently gave Rs. 2,00,000 to endow a series of travelling scholarships for post-graduate training in lung diseases. Two scholarships, valued at Rs. 10,000 each, will be granted each year to young Australian or New Zealand physicians. Duration of each scholarship is from one to three years.

(Advocates of similar schemes for India will do well to remember that tuberculosis itself is a dying disease.— Entrop. IM.G.)

BRITAIN IS PROVIDING HOSPITALS FOR PAKISTAN

(Reprinted from the South African Med. Jour., Vol. 22, No. 5, 13th March, 1948, p. 189)

Great progress is being made by the British Red Cross Society in its work of relieving distress in India and Pakistan. The Society's medical adviser, Air-Marshal Sir Harold Whittingham, has just said that the first of four hospitals which Britain is providing for Pakistan will be opened in March.

The main medical centre will be Lahore, and will have beds for four hundred patients. The three subsidiary hospitals will have fifty beds each. In addition there will be three mobile dispensaries with a fleet of twenty-four ambulances.

Specialists to staff the first hospital are now being recruited in Britain. They will number about twenty-four and be headed by Colonel Lowe, who has served with the Indian Medical Service for twenty-four years. During the last 13 years he has been working exclusively for the civilian population. The remainder of the staff is being engaged in India and Pakistan.

These four hospitals will provide the foundation in Pakistan for an organized scheme for the relief of disease and suffering. It will cost one hundred thousand pounds to establish them and two hundred thousand pounds a year to maintain them. Voluntary donations are coming in steadily from all parts of Britain in support of the Society's project.

QUININE

(Reproduced from The Pharmaceutical Journal, 4th Series, Vol. 106, 10th April, 1948, p. 250)

Two fatal cases of poisoning by quinine have been reported. At Bradford, an 18 months' child died after she had swallowed a number of five-grain tablets. Her father, who suffered from malaria, placed a pill box containing 25 of the tablets on a table. Unnoticed, the child opened the box, put some of the tablets in her mouth, and replaced the lid. She became ill, but the cause was not suspected until two tablets were seen in her vomit. When the box was examined, 14 tablets were missing. She was taken to hospital, but died four hours later. At Manchester, a woman died after she had taken about 100 grains. She was pregnant. The coroner said that he did not think that she meant to destroy herself.

QUARANTINE NOTICE

(Issued by the Director-General of Health Services, New Delhi, on 16-8-48)
INDIAN PORTS AND PLACES

Vol. III, No. 33

Vol. 111,	No. 33				
Against	port or	place	Imposed by	Date	Diseases
		ſ	(a) New restrictions imposed]	
India	Sea and	Air .	Malta. (b) Old outstanding restrictions (16th August, 1948).	11-5-48	
India	Sea and	Air	Inan and Turkey	20-5-48	Plague
77	33	••	Persian Gulf Ports (Muscat Trucial Coast, Bahrein or Kwait).	2-3-48	Cholera and smallpox
79	39	• •	British Somaliland	4-11-47	Cholera
4	19	••	Palestine	2-1-48	Plague and smallpox
11	11	••	Syria	4-12-47 12-11-47	Cholera
>9 >1	11	••	Malayan Union	23-10-47	97
16	**	••	Singapore Colony	24-10-47	27
19	11	••	Netherlands Indies	24-10-47 22-10-47	37
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**	19	••	Ceylon	26-9-47	31 31
11	11	• •	Union of South Africa	30-8-46	Smallpox
11	**	• •	Egypt	11-4-45 8-8-47	Cholera
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"	"	••	Ethiopia (East Africa)	21-11-47	Cholera
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Note

(i) Smallpox and cholera.—Most foreign countries require smallpo:

certificates from Passengers going abroad should nselves vaccinated and inoculated at Government or Municipal institutions and obtain the certificates on the prescribed inter-national forms from the medical officers attached to these institutions. The internationally accepted period of minimum and maximum validity are:—

Minimum period

Maximum period

3 years Smallpox 14 days (for Japan 6 months) Cholera 6 " (" " 4 ") 6 months

(ii) Plague.—Plague inoculation certificates are not prescribed in international practice. These certificates are however being demanded by Iraq, Iran and Turkey only. There is no prescribed forms for plague inoculation but the form of chelors extificate artificate. tion but the form of cholera certificate may be used by substituting the words 'Plague' for 'Cholera'. The

maximum validity period is 6 months.

The inoculation for plague and cholera should be given in two doses with an interval of one week.

(iii) Typhoid.—Certificates of inoculation against typhoid are required by some countries in the Far East, e.g. China, Japan, etc. As no international form is prescribed for typhoid, the form prescribed for cholera may be used after substituting the word 'Typhoid' for 'Cholera'. The maximum validity period is one year.

(iv) Typhus.—Typhus inoculation certificates are NOT required except by Japan. Japan requires typhus

noculation certificates to be less than 60 days old.

(v) Yellow fever.—Yellow fever inoculation certificates are NOT normally required from Indian passengers except by a few African countries. As the storage and administration of yellow fever vaccine is controlled by the Government of India, this vaccine is NOT available to rejurge medical matthias. NOT available to private medical practitioners or to the general public. In India, yellow fever inoculations are given and certificates issued at the following Government centres only:

Government centres only:
(i) Haffkine Institute, Bombay. (ii) All-India Institute of Hygiene and Public Health, Calcutta. (iii) King Institute of Preventive Medicine, Guindy, Madras. (iv) Central Research Institute, Kasauli. (v) The Provincial Public Health Laboratory, New Delhi. (vi) Airport Health Officer, Bombay Airport, Santa Cruz. (vii) The Chief Medical Officer, Porbandar, Porbandar State. (viii) Nawanagar State Irwin Hospital. Nawanagar State.

Irwin Hospital, Nawanagar State.

TRANSPARENT BANDAGES FOR WOUNDS

ADVANTAGES OF NYLON DRESSINGS

By TREVOR I. WILLIAMS

(Reproduced from Release No. BF/2, issued by British Information Services, Mansingh Road, New Delhi)

Am Hough the bandaging of wounds must be one of the oldest and most important forms of medical treatment, even the best of modern bandages are not ment, even the best of modern bandages are not entirely satisfactory, because so many conditions have to be fulfilled. For this reason a research unit sponsored by the British Medical Research Council has been investigating the possibility of using new types of material for surgical dressings.

Recently, they have reported that a new kind of nylon sheet has proved remarkably successful: To make this nylon sheet, the basic nylon material is transformed, not into the filaments used for stockings or fabrics, but into a thin sheet or film rather like

or fabrics, but into a thin sheet or film rather like

that used for plastic raincoats. The sheet is solid, while nylon stockings or fabrics are merely woven materials full of holes between component fibres.

Research at Birmingham

This research into the use of such nylon for bandages has been done at the Birmingham Accident Hospital a hospital which is unique of its kind, not only in Britain but in the world—where it has been possible to test the new type of bandage very thoroughly on many different kinds of injury.

Trials are still continuing, but, unless unexpected difficulties are encountered, it is likely that it will eventually be used in hospitals throughout the world.

The biggest defect of even the best of modern

The biggest defect of even the best of modern dressings is that they cannot keep out liquids and germs, and at the same time allow moisture from the wound and the skin surrounding it to escape. For example, when an ordinary bandage or cotton-wool becomes wet, motile germs can swim through them and infact the ground underpostly. Although the formation of the state of infect the wound underneath. Although sheets of many kinds of material can quite satisfactorily keep out liquids and germs, they provide no outlet for the moisture which the skin normally loses as perspiration.

When we perspire, this perspiration becomes visible but even when we are resting, as much as half a pint of water is lost by evaporation from the skin every 24 hours. If a bandage prevents evaporation, the skin under it becomes sodden and unhealthy and the difficulty of healing a wound is increased.

Quick Sterilization

A pointer towards the new bandaging material came A pointer towards the new bandaging material came from wartime research on clothing for troops fighting in the tropics. There the same problem arose—of finding a material which was sufficiently waterproof to protect the wearer from heavy rain, and yet would not prevent the evaporation of perspiration. It was discovered that it was possible to make fabrics which would allow the passage of water vapour and yet be quite impervious to liquid water.

Guided by this discovery the Birmingham research

Guided by this discovery, the Birmingham research team tested various possible materials but they were handicapped, compared with the designers of tropical uniforms, by the fact that any wound dressing must be capable of quick and complete sterilization either by heating or by soaking in antisepties. A type of nylon sherting alone fulfilled all their stringest requirements sheeting alone fulfilled all their stringent requirements. Even when the sheet was immersed for several hours in cultures of germs far stronger than any normally found in infected wounds, none of the germs passed through it. It can be sterilized either by dry heat or by antiseptics in common use.

Laboratory tests showed that water vapour would pass freely through the sheeting, but this was tested on human 'guinea-pigs'. Some areas of their skin were covered with patches of polythene—a plastic which is almost impervious to water vapour—and others with patches of aylon sheeting. In a few hours sufficient water collected under the polythene to be plainly cient water collected under the polythene, to be plainly visible, and when the patch was removed, the skin beneath it was found to be sodden with water. Under

nylon, however, the skin was perfectly dry.

Another great advantage of the new dressing is that it is quite transparent, which means that the healing of a wound can be inspected at any time without

trouble or pain.

Germ-proof

Research workers found some difficulty at first in preventing germs finding their way under the edges of the dressing, but at last they found a type of adhesive plaster which forms a perfect seal and with these and transparent nylon sheeting they make little windows which can be fitted over the wound and will stay firmly fixed in place for days on end. The only common agent which will remove this kind of dressing is oil, but a special type of adhesive has been devised for dressing wounds which might become oily, for example on the hands of garage workers,

The new type of bandage should prove of great value not only to patients undergoing hospital treatment but also for the dressing of minor injuries—of the cut finger type-which constantly occur in daily life, especially among industrial workers. As it causes the minimum of interference with movement, and can be left in position for several days, minor injuries need cause no interruption to work or play.

Apart from its immediate practical value, the bandage has been used for a remarkable demonstration of the powers possessed by unbroken skin, of destroying countless germs—some harmless and others very dangerous—which constantly fall on it from the air, and from almost everything which comes in contact with it.

When swabs were taken of the skins of 77 different people, no fewer than 39 yielded cultures of one of the commonest types of infective staphylococci. But where the skin was protected by patches of the nylon dressing, so that no further infection could take place, it succeeded in completely freeing itself of staphylococcal infection within a few days.

COMMUNITY HEALTH SCHEME FOR 11,000 WORKERS

BRITAIN PIONEERS NOVEL EXPERIMENT

(Reproduced from the Circular No. BF. 113, of the British Information Services, Office of the U.K. High Commissioner in India, New Delhi)

A community health service, started as an experiment in May last year, is now catering to the medical needs of some 11,000 factory workers on a trading estate near London. It is the most advanced of its kind in Britain and is being watched with interest by many who believe that it provides a valuable model for the nation-wide industrial health scheme of the future.

The service, shared by 99 firms on the Slough Trading Estate, is calculated to be saving many thousands of hours of working time by providing prompt medical attention in all cases of injury and ill health. Every member-firm pays an annual fee for each worker employed. When a new firm joins, discussions are held between the medical director and the management and the aims and methods of the health service are explained to the workers.

Each factory has its own first-aid post, staffed by workers who are trained by the service itself. If casualties require further treatment, they can obtain qualified medical attention at one of the two ambulance posts on the estate or at a central clinic which forms part of the local community centre. Seriously injured workers can be rushed to the clinic by a special

accident van carrying a doctor and a nurse.

Mobile dressing station

A unique feature of this service, which is already attracting interest in other countries, is a special mobile dressing station. This is a five-ton tractor unit, with a trailer-carrying van divided into two rooms—one for examination and the other for treatment. The van is used for re-dressing wounds at a distance from the central clinic and has reduced the time an injured worker spends away from the bench for this kind of treatment from several hours to a few minutes. It is claimed that the mobile dressing station is saving member-firms no less than 600 man-hours of productive time every month.

Also available as part of the service is a recuperation hospital, with a staff of highly-qualified rehabilitation

experts.

Every month 1,000 new cases are treated by the service and the average attendance at the clinics is 3,000. This is an indication of the immense saving in ill health and productive time effected by the service. At present the cost of the service is well above the sum contributed by the member-firms, but small in relation to the rising standards of health and output of workers. Until the scheme pays its way the extra cost is being met by the private concerns which first sponsored this service.

Only large factories can afford to supply comprehensive health services of their own. Of the 220,000 factories in Britain, under 5,000 employ more than 250 workers. Over 50 per cent of Britain's factory workers are employed in smaller establishments such as those sharing the health service at Slough.

PENICILLIN FOR THE TROPICS

(Reproduced from the Circular No. BF. 148, of the British Information Services, Office of the U.K. High' Commissioner in India, New Delhi)

A PREPARATION of penicillin ideal for the tropics was one of the most interesting exhibits at the Chemists' Exhibition held in London recently. It is the product of British research and is being produced exclusively in Britain.

The new product is a potassium salt of penicillin which keeps for three or four years even in the tropics This salt has only been introduced to the medical profession within the last few weeks.

A further development in the application of penicillin was also demonstrated at the exhibition. This is 'avloprocil' which contains the procaine salt of crystalline penicillin in simple oily suspension. The whole point of using 'avloprocil' is to slow down the absorption of penicillin into the blood stream and so produce more prolonged effective blood levels. This has the advantage of lessening the number of injections necessary for keeping measurable concentrations of penicillin maintained in the blood throughout the period of treatment.

'Avloprocil' is most unlikely to cause unpleasant reactions and a single daily injection is usually adequate

for effective penicillin therapy.

MECHANICAL 'NURSE' ON HOSPITAL DUTY

NOVEL DEVICE DEMONSTRATED AT BRISTOL

(Reproduced from Release No. BF. 187, issued by the British Information Services, New Delhi)

A MACHINE that will considerably lighten a hospital nurse's work has been demonstrated at Winford Orthopædic Hospital, near Bristol. The device, invented by a garage mechanic, Mr. Cecil Cullen, enables one nurse to lift a heavy patient and turn him over in hed in safety and comfort.

The Resident Medical Officer of the hospital is full of enthusiasm for the machine and at the demonstration described it as 'something we have been waiting for for years'. 'Until now', he said, 'it has taken four or five nuises to move a spinal patient, with a risk of harm to the patient. This machine cannot go wrong'.

For the purposes of the demonstration a patient, weighing 12 stones, suffering from a tubercular spine and encased in plaster from neck to toes, was lifted by the turning of a handle by a nurse. Suspended in triple canvas slings, he was turned face downwards, wheeled in the apparatus to another part of the ward,

and lowered on to a hospital trolley.

In an interview the inventor said that he got the original idea from a doctor who was himself a patient original idea from a doctor who was himself a patient at Winford Hospital and, as he was a six-footer weighing over 16 stones, he gained first-hand impressions of the nurses' struggles in handling a heavy patient, Mr. Cullen has produced a series of machines, one of which has been tested by the Ministry of Pensions and which he hopes will be used all over the world.

Public Health Section

OCCUPATIONAL DISEASES IN RELA-TION TO THE MANUFACTURE OF DICHROMATES: THEIR PREVENTION AND TREATMENT

By V. R. NAIDU, MB, BS, MS. (Path), FISCP, DTM.&H. (Eng.), MBCP. (Lond)

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and

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Among the numerous uses the chromates and dichromates are put to, the chief ones are the manufacture of chrome colours used in the textile industry and tanning of hides. During the war, the demand for dichromate compounds in this country was so great for these two industries, that many factories of varying productive capacity sprang up in many places. Incidentally, the occupational diseases also showed a relative increase.

In the manufacture of dichromate, the powdered chrome ore (Fe₂Cr₂O₅) is mixed with lime (CaO) and soda ash (Na₂CO₂) in the proportion of three parts of ore to two parts of lime and soda ash. The mixture is charged into furnaces where it is heated up to 1,000°C. for eight to ten hours. Compressed air is blown into the furnace and the mixture is raked from time to time to ensure uniform conversion. When all the ore has been converted into sodium chromate, the mixture is removed and treated with weak chromate liquor and subsequently with 98 per cent sulphuric acid in lead-lined tanks where the chromate gets converted into dichromates. The dichromate solution is then concentrated in steam jacketed vessels. The less soluble sodium sulphate separates out, which is further subjected to centrifugalizing to remove dichromate sticking on to the sulphate. sodium dichromate solution so obtained is either packed in drums as such or crystallized.

The workmen employed in the industry are exposed to two types of hazards: (1) the effects due to the dust and (2) the effects due to the soluble chrome compounds.

The effects due to dust are chiefly on the respiratory passage and occasionally on the conjunctiva. The dust raised while mixing the various components, particularly while charging the furnaces, acts as an irritant on the respiratory mucous membrane. Drying, grinding, transporting and packing of the products also cause dust varying in amount to the technique used. The effects on the mucosa may be immediate or remote depending upon three factors, viz, the solubility, the size of the particle and the chemical reaction.

The dust raised in the first stage while mixing the crushed chrome ore, lime and soda ash may reasonably be said to cause the upper respiratory lesions. It is found that most of the dust at the breathing level is composed of soda ash and lime, and not chrome. Since the chrome ore is heavier it does not rise high on stirring. Therefore, the respiratory lesions are caused mostly by the soluble soda ash and lime with a sprinkling of chrome. These chemicals are readily absorbed by the moist surfaces of the respiratory passages and they being alkaline act as mild caustics. The silien content of the ore is found to be less than one per cent and therefore is innocuous to the lungs.

The effects of inhalation of the dust are more or less immediate and are due to their chemical reaction. The effects are chiefly confined to the upper respiratory passages. Workers complain of frequent nasal catarrh, especially when they are new to the work. Likewise these men engaged in the concentration and centrifugalization of dichromate solutions breathe fine droplets of the solution and complain of ulceration of the nasal septum, formation of crusts and consequent bleeding and obstruction of the nasal passage. Respiratory troubles like pharyngitis, laryngitis and bronchitis are not infrequent and sometimes up to sixty per cent of the workmen engaged in the particular section suffer from these.

Chronic conjunctivitis met with among the workmen employed in the concentrating and centrifugalizing section is another distressing condition. They complain of burning sensation in the eyes, lacrimation and stickiness of the eyelids. The conjunctival vessels are much congested, and in many they remain so for weeks, even after withdrawal from the section. We have not come across any case of keratitiscaused by chromic acid or its compounds.

The effects of soluble chrome compounds, however, are far more diagnostic than the former group. Vapours containing minute particles of eaustic materials pervade the surrounding atmosphere during the process of evaporating, boiling or centrifugalizing the solutions, during the removal of sludge or in packing and transporting dichromates. Fine droplets of dichromate liquor cause nasal, ocular and allergic lesion. The soluble chromates act as caustics and astringents except in great dilutions and readily affect abraded and injured skin, resulting in ulceration. It is very rare for ulcers to develop on an unbroken skin.

The usual sites of ulceration are the hands and feet. They may occur anywhere on the body, and even such places as scrotum are no exception. On the hands the fayourite sites are the knuckles, bases of the nails and the opposing surfaces of the fingers (figure 2, plate XXII);

likewise on the toes the ulcerations occur on the corresponding sites. On the soles of feet, the cracks and fissures favour collection of chrome compounds and lead to punched out indurated ulceration (figure 3, plate XXII). Ulceration is uncommon if the workers are adequately protected.

The ulceration of the skin commences in an insidious manner with central necrosis and hardly any signs of inflammatory reaction. There is no pain in the early stage. The ulcer, if neglected, becomes deeper and ultimately reaches the bone or the joint. The lesions have no tendency to heal spontaneously and therefore require prolonged treatment. It is quite usual to find several ulcers in the same individual. Medical intervention does not prevent the formation of cicatrices, though the cure is effected in a much shorter time. The cicatrices neither cause deformity nor functional derangement.

Skin eruptions in the form of eczema and acne are less common than ulcerations, and they take a very long time to heal. They are aggravated by heat, moisture, perspiration and maceration of the skin. These lesions are common among young persons and those with tender skin.

The lesions caused by chromates on the nasal mucous membrane are characteristic. They are hypertrophy of the mucous membranes, ulceration, encrustation and perforation of the nasal They are mostly seen among those who have frequent attacks of rhinitis with coryza and those who have the bad habit of pricking the nose with fingers. The ulcer is situated at the lower middle part of the septum, generally circular in shape without much signs of reaction. Gradually the ulcer becomes deeper and deeper involving the cartilage, finally leading to perforation (figure 4, plate XXII). It does not affect the shape nor the function of the nose. Neither do the lesions exercise any injurious action on the respiratory or digestive apparatus. The general health remains more or less good. Healing by cicatrization of the edges takes place if the workmen leave the occupation early, otherwise the perforated nasal septum remains patent throughout life. The lesion may appear as early as eight days though they are generally seen after 6 to 8 weeks.

The lesions due to chromates are certainly more common than are usually admitted. It was Cumming of Glasgow (International Labour Office, 1929) who described the ulceration among the workers of a bichromate factory. Since then reports have been published from France (Becourt and Chevallier, International Labour Office, 1929), America (Isaac, 1922), and Germany (Hermanni, 1925; Sommerfeld, 1910; Lehmann, 1922). From Great Britain, Legge (1902) reported that among 176 workmen 71.6 per cent had perforation of the septum and 11.3 per cent had ulceration of the nasal mucous membrane without perforation. In

Italy, Ranelletti (1919) found among 69 workmen handling potassium bichromate ulceration of the nasal mucous membrane in 38 or 56.5 per cent, 7 of whom or 15.7 per cent showed perforation of the septum. In Russia, Wilensky (1924) found in a chromate factory 197 out of 278 workers with occupational lesions. Hellmann (International Labour Office, 1929) reported 5 cases of ulceration of the hands and forearms by a bichromate used as a mordant out of 18 workmen. These ulcerations were slow in development, relapsed frequently and left deep cicatrices.

A medical survey was conducted by one of us (R. N. R.) at one of the bichromate factories. The staff and the workmen totalled 152 men. They consisted of supervisors, office clerks, furnace men, mill men, electricians, store clerks, shift operators, fitters and many other helping hands. They have been in service from 3 months to 4½ years. Every new entrant was questioned of his previous illness before he was subjected to a thorough clinical examination. The records of their health were maintained by the medical officer. All the workmen were subjected to periodical examination and were given medical help whenever needed.

We found that among the workmen chrome ulceration was seen in 23 per cent, scars in 33 per cent, nasal ulcerations, epistaxis and perforations in 54 per cent, respiratory infections like frequent attacks of cold, cough and asthma in 20 per cent, eye complaints in 10 per cent and dermatitis in 4 per cent. There was none with general rundown state of health attributable to these chemicals. Bronchial spasms simulating asthma were observed in five individuals and two of them had to be subsequently transferred to other sections free from such dust. The latter definitely showed improvement both in frequency and severity of the attacks. It impressed us that the two asthmatics were primarily allergic and having been subjected to the dust inhalation had frequent exacerbations.

Treatment

The importance of personal cleanliness was impressed from the beginning on all new entrants to the service. They were instructed to wash their hands and feet frequently in a stream of running water, and a sufficient number of water taps was installed for that purpose within the premises. They were asked to brush the nails and use plenty of soap in cleaning their hands. The surgical attendant was instructed to seal the accidental abrasions with tineture benzoine or with an adhesive to prevent contamination.

Posters were hung up almost in every room drawing the workmen's attention to the

- following:—

 1. To seek immediately the aid of the surgical attendant on duty for all accidental cuts and abrasions.
- 2. To seek immediate medical aid if they should develop chrome ulcers.

PLATE XX PLATE XX A LARGE PHEOCHROMOCYTOMA OF THE ADRENAL GLAND: M. R. SUBBA RAO & T. BHASKARA MENON. (O. A.) PAGE 401

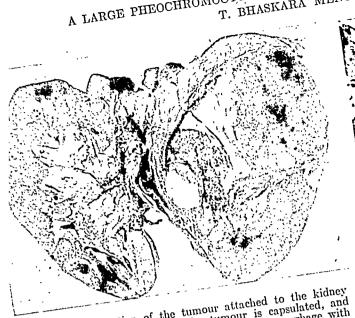


Fig. 1.—Hemi-section of the tumour attached to the kidney with a broad fibrous band. The tumour is capsulated, and the cut section shows areas of necrosis and hæmorrhage with tumour tissue in between.

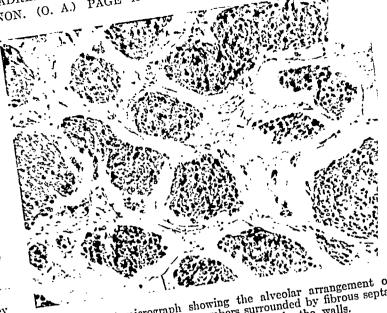


Fig. 2.—Photomicrograph showing the alveolar arrangement of the cell groups, the varying numbers surrounded by fibrous septa. The cell groups, the varying with capillaries in the walls. H. & E. (× 180) with capillaries in the walls.

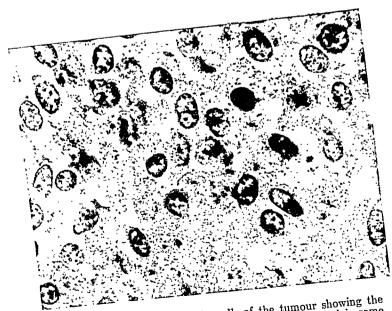


Fig. 3.—Photomicrograph of the cells of the tumour showing the granular cytoplasm, hypercremasia, oval or round nuclei, some granular cytoplasm, hypercremasia, oval or round nuclei, some showing a well-stained nucleolus. H. & E. (× 1,200).



Fig. 1.



PLATE XXII

OCCUPATIONAL DISEASES IN RELATION TO THE MANUFACTURE OF DICHROMATES: V. R. NAIDU & R. NARAYANA RAO. (P. H. S.) PAGE 431



Fig. 1.

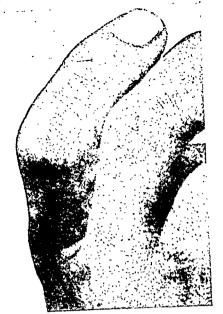


Fig. 2.



Fig. 3.



kıg. 4.





Fig. 5.



3. To wear gloves and rubber boots (clean and dry) on greasy hands and feet whenever possible.

4. To wash thoroughly hands and feet in a stream of running water after their work with

special attention to the nails.

5. To bathe every day after their duty and to wear clean clothes. They were made to understand that no object was gained by wearing the soiled workdress again.

6. To seek medical aid for all the respiratory

and eye complaints.

7. To wear a mask to prevent dust entering the respiratory passages while working in mortar and furnace sections. In addition to personal prophylaxis, the premises of the factory were daily swept and kept clean and, as far as possible, free from contamination with chromates. Exhaust fans were installed for removal of fumes and dusts wherever possible. The use of respirator was not satisfactory. Though ideal conditions could not be obtained due to wartime conditions, best efforts were however made in various directions to reduce the risk to a minimum level.

In order to study the efficiency of various local emollient applications on the chrome ulcers, one of us (V. R. N.) attempted to produce chrome ulcers on several guinea-pigs. It was found that a mere application of strong bichromate solution on the surface of the skin failed to produce an ulcer unless there was an abrasion. The chemical had to be applied once a day for more than three days for the formation of an ulcer. These animals exhibited lesions exactly similar to the chrome ulcers seen in workmen (figures 1 and 5, plate XXII).

figures 1 and 5, plate XXII).

If the application of bichromate solution was soon followed by 5 per cent sodium thiosulphate, the injury remained superficial and the healing was found to be rapid. The corresponding control animals with saline wash did not respond so readily. If the abraded skin was previously protected with sterilized vaseline or liquid neutral soap, even repeated applications of the bichromates did not cause any ulceration. Incidentally we observed that the healing of ulcers was rapid if the central necrotic plugs were removed by manipulation and antiseptics

subsequently applied.

When ulcers develop they require prompt and carly treatment to prevent becoming indolent. The two important measures scrupulously followed for the rapid healing of such wounds were the prevention of further contamination by adequate protective dressings, and to dislodge any chrome compounds if they were already deposited in the wound. The chrome compounds being water-soluble were dislodged by repeated scrubbing in clean water. Secondary infections were controlled by the addition of mild antiseptics. Chrome compounds situated in the deeper layers were rendered inert by scrubbing the part with 5 to 10 per cent sodium thiosulphate solution. In a series of 20 cases treated

by the above method, the cure resulted much carlier. In deep punched-out ulcers, incision was necessary in a few cases to allow proper drainage and to get at the base of the ulcer. There were no incidents which suggested generalized chrome poisoning. In fact none have been reported in the literature.

Summary

Among the many new industries sprung up since the war, bichromate industry is one. Workmen exposed to the dust and causties during the manufacture of these compounds are susceptible to nasal catarrh, ulceration of the septum, conjunctivitis, upper respiratory inflammations and chrome ulcerations on the hands and feet. A survey conducted in one of the dichromate factories revealed that the incidence of this condition is much less than that reported elsewhere. Personal cleanliness and immediate medical attention are responsible for the reduction of the incidence.

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VITAMIN-'A' DEFICIENCY AMONG A GROUP OF SOUTH INDIAN COLLEGE STUDENTS

By V. KRISHNA ROW

MAJOR

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Introduction

During World War II (1939–1945), India had not only to feed her own population and her fighting forces but also to send supplies to the various theatres of war. The food supply was gradually becoming insufficient. A number of factors contributed to the food shortage. Shortage of agricultural labourers who preferred the more lucrative army career, continuous drain of foodstuffs by the army, and hiding of stocks by hoarders and merchants who were expecting to get higher prices for their stocks all played their part. In 1943, there was the great Bengal Famine and in that year a food rationing system was introduced throughout India. The main articles rationed were rice; wheat,

sugar, and to a less extent, the pulses (dal,

Bengal gram, etc.).

During the latter part of 1947, the rationing system was partially abolished and prices decontrolled. Despite that, the food situation did not much improve and the man in the street was unable to get a square meal a day, unless it was at an exorbitant price.

During the war years, the food habits of the general population were slowly changing, much to the detriment of their health and physical fitness (Row, 1938). Rice, fruits, vegetables, milk and milk products (ghee, butter) became scarce. Tinned foods, tinned fruits, hydrogenated oils, etc., came into prominent usage. Poor people could not afford to buy these costly articles of food and they went without them. The rich who alone could use them had to pay a high price. The shortage in fresh foods and the high prices of tinned foods caused a further deterioration in the dietary of the Madrassis which even normally had been condemned as poor in respect of its protein, fat, and vitamin

content. After the return of the writer from active military service of 6 years to his old post, he had the opportunity during 1947-1948 to conduct medical inspection of the students of the Presidency College, Madras. The medical examination was confined to the new entrants to the college in the first and third year University classes. The medical examination revealed \mathbf{a} high incidence of vitamin-A The present communication contains deficiency. some of the results of the medical examination.

Out of a total of 633 students examined, 156 showed signs of vitamin-A deficiency. Details are shown in table I.

Table I

Giving the distribution of vitamin-A deficiency
in the two University classes

	First year	Third year	- Total
Number affected	105	51	156
Number examined	383	250	633
Per cent affected	27.42	20.40	24.64

Clinical signs of vitamin-A deficiency

Vitamin-A deficiency is diagnosed by clinical signs, biochemical tests, and photometric methods. In this investigation, only the clinical signs were taken into account. The other two methods could not be employed due to lack of facilities.

The common clinical signs of vitamin-A deficiency are the presence of Bitot spots in the conjunctiva, xerosis of the conjunctiva, follicular keratosis, angular stomatitis, and night blindness. These were specially looked for in all the students examined. Table II gives the results.

Table II

Distribution of clinical signs for vitamin-A deficiency in the group studied

Clinical signs	Number	Per cent of the affected
Bitot spots Xerosis of conjunctiva— Marked Slight Angular stomatitis Total number with vitamin-A deficiency. Total number examined	11 124 20 1 156 633	7.05 79.49 12.82 0.64

For comparison, data pertaining to vitamin-A deficiency in a group of American boys below 19 years of age are given (National Council, U.S.A., 1943):—

		_	
		New York City School, per cent	School,
Bitot spots Xerosis	(gross spots)	 7.7 86.6	8.15 88.6

Comparing these data with the Presidency College students, it will be observed that the frequency distribution of the different clinical signs is about the same.

It is interesting to mention here that during a nutritional survey in Canada in 1943, '40 per cent of the population were found to be on the border line, 40 per cent were not getting a sufficient amount of proper food according to the accepted standards, and only 20 per cent were receiving amounts of food considered adequate to provide the normal requirements of the body. In America, no less than a third of the population has poor diet' (Amyot, 1943).

If such are the conditions prevailing in countries economically better placed than India, the high incidence of vitamin-A deficiency noted among the Presidency College students need not cause any surprise. On the other hand, taking into consideration the lack of availability of sufficient food in India and the defects in the common Indian dietaries in general and of the Madrassi dietary in particular, it is surprising that the students are not worse off than the American boys.

In course of the medical inspection of the college students, in addition to the signs of vitamin-A deficiency, other physical defects were also noted. Data pertaining to these which give some indication of the general status of nutrition of the students examined are presented.

Comparing the two groups of students with regard to the physical defects, it is found that the group with vitamin-A deficiency has significantly higher incidence of dental defects,

Vitamin Therapy-its uses and limitations

SAFER PRECNANCY

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. 5. .

LOSS OF SOFT TISSUE AND OF MANDIBLE

Gypsona as an adjuvant in

CASE HISTORY. The patient was injured in July 1941, when his ship was bombed and machine gunned. Examination showed the lower hp divided and a loss of soft tissue of chin and of mandible from right-molar region to left

Fig. 1

meisors. On August, 1941, two tube pedicles were raised on the neck. These were lengthened four weeks later. On 22nd October, the scars were excised from the face and the two pedicles attached.

November 11th, 1941 .--The pedicles divided.

February 24th, 1942.—A bone graft was inserted.

June 26th, 1942.—An acromio-thoracie tube pedicle was raised.

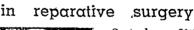




Fig. 2

October 20th, -1943 .- Chin dimple made.

The details and illustrations are of an actual case. T. J. Smith & Nephew Ltd., of Hull, England. manufacturers of Elastoplast and Gypsona, publish this instance typical of many in which their products have been used with success.

July 22nd. 1942.—The pedicle lengthened.

July 31st, 1942.—The ped-icle attached one end.

September 24th, 1942,-The pedicle attached the other end.

February 2nd, 1943 Affurther bone graft was 195erted with Gypsona P.O.P. headcap and plaster between each pair of pins.



Fig. 3





Pain is almost always accompanied by nervous manifestations and often, too, by fever. Hence, pain suppression is usually only a part of the therapeutic task. Pain must not only be stopped but the associated nervousness must be calmed and an existing high temperature reduced to normal. VEGANIN is an efficient means of achieving these objectives. Because of its synergistic combination of acetylsalicylic acid, phenacetin and codeine, the effect of Veganin is rapid and prolonged. The patient experiences almost instantaneous relief from pain; the nervous irritability and fever quickly subside, preparing the way for rest and recuperation. If no

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The Principles and Practice of Tropical Medicine

Part II

L. Everard Napier

C.I.E., F.R.C.P. (LONDON)

Formerly Director and Professor of Tropical Medicine, Calcutta School of Tropical Medicine, Superintendent and Senior Physician, Carmichael Hospital for Tropical Diseases, Calcutta, and Editor of the Indian Medical Gazette.

Thacker, Spink & Co. (1933), Limited.

TABLE III

Showing physical defects among students affected and not affected by vitamin-A deficiency

	Arfe		UNAFFECTED GROUP	
Defects	Num-	Per	Num-	Per
	ber	cent		cent
Defective vision Dental defects Enlarged cervical glands Cardiac defects Trachoma Those showing no defects	38	24.36	55	11.53
	30	19.24	70	14.68
	12	7.70	8	1.68
	10	6.40	16	3.35
	2	1.30	2	0.42
	64	41.00	326	68.34
Total number	156		477	

defective vision, enlarged cervical glands and cardiac defects.

Dental defects.—The dental defects are classified as follows: Tartar, caries, pyorrhæa, dirty teeth and irregular teeth. The incidence of these dental defects are given in table IV.

TABLE IV
Giving the details of dental defects

	AFFE	CTED TOUP	Unaffected group		
Dental defects		Num- ber	Per cent	Num- ber	Per cent
Tartar Caries Pyorrhœa Dirty teeth Irregular teeth		22 1 2 5	73.3 3.3 6.7 16.7	46 2 1 3 18	65.7 2.9 1.4 4.3 25.7
Total dental defect	s	30	100	70	100

Defective vision.—The incidence of defective vision among the two groups of students, as judged by the error of refraction, shows that in the vitamin-A deficiency group, double the number of students have defective vision. Whereas 11.53 per cent have defective vision in the unaffected group, 24.6 per cent show the defect in the affected group. It is very difficult to say whether vitamin-A deficiency plays a part in this or not.

Enlarged cervical glands.—There is a very significant difference in the incidence of enlarged cervical glands in the two groups. The high incidence of enlarged glands in the vitamin-A deficient group suggests that there is probably some relationship between glandular enlargement and vitamin-A deficiency. The high

incidence may also be explained on the grounds of differences in the economic status of the two groups, leading to a lowering of the general nutritional status.

Cardiac defects.—The vitamin-A deficient group showed a higher incidence of functional disorders of the heart such as tachycardia, extrasystole, and weak heart sounds than the

non-deficient group.

Trachoma.—The difference in the incidence of trachoma in the two groups is not statistically significant. Yet the increased incidence in the vitamin-A deficient group may be interpreted to mean that the deficiency may be a predisposing factor in the causation of the disease. This however needs further confirmation.

In order to find out whether the vitamin-A deficiency formed a part of the general lowering of the nutritional status of the students or whether it was independent of this, a further investigation was made into—(i) the general status of nutrition; (ii) the economic status; and (iii) the dietary of the groups.

General status of nutrition

Various standards of assessment of the state of nutrition of the general population are in vogue (Row, 1941). In the present study the following three methods were adopted:—

1. The British standard of assessment, as recommended by the Board of Education, England, and adopted in schools, classifying as excellent, normal, subnormal or bad.

2. Taking into account the age, height, and weight for working out the Livi's index based on the formula—

L.I. =
$$3\sqrt{\frac{\text{Weight (kg.)} \times 100}{\text{Height (cm.)}}}$$

3. Estimating the grip strength by means of the hand dynamometer and taking the maximum pressure in pounds (lb.), exerted by the students, as a measure of physical stamina.

The results obtained by each of these three methods are presented in tables V, VI and VII.

In table V, the percentage of the excellent in both the groups is more or less the same. The percentage of the normal in the affected group is lower than that in the unaffected group. The proportions of normal and subnormal (state of nutrition) in the two groups of vitamin-A deficiency and non-deficiency are significantly different.

The percentage of the subnormal and bad in the affected group are also greater than that of the unaffected group. The data indicate that the affected group compares unfavourably with the unaffected group.

From table VI, it will be seen that age for age, the weight and the Livi's index are in the affected group slightly less than those in the unaffected group.

For comparative purposes and for general information, the Livi's indices of other races and groups are tabulated below.

TABLE V

Showing the results of assessment of the state of nutrition according to the British standard

				AFFECTE	ED GROUP	Unaffect	ED GROUP	TOTAL CLAS	S STRENGTH MINED
	·			Number	Per cent	Number	Per cent	Number	Per cent
Excellent Normal Subnormal Bad	•••	,	;	18 67 63 8	11.54 42.95 40.38 5.13	57 - 269 137 14	11.95 56.39 28.72 2.94	75 336 200 22	11.85 53.06 31.60 3.49
	TOTAL	NUMBER	• •	156	• •	477	••	633	

TABLE VI

Giving the average age, height, weight and the Livi's index for the affected and unaffected groups

	AFFEOT	ED GROUP ·	Unaffeo	Unaffected group		COMBINED	
	First year	Third year.	First year	Third year	First year	Third year	
Average age (years/months) Average height Average weight (lb.) Livi's index	5′ 4″	19/4 5' 5" 104 2.86	17 5′ 4″ 99 2.77	18/9 5' 4" 105 2.94	5′ 5″ 99 2.73	19 5′ 5″ 108 2.93	
TOTAL STRENGTH OF THE GROUP	156	••	477	2`	633	• •	

Livi's index of other nations and races

	<u> </u>
North Chinese	3.39 \
South Chinese	3.29
Javanese	3.25
Japanese	3.37 Taken from the
Belgians	3.37 Report of the
Dutch	3.37 Calcutta Univer-
English	3.38 sity Students
Swies:	3.39 Welfare Com-
Jews (Russian and German).	
Bengal Hindu students	
High caste Hindu students	
Lower caste Hindu students	
* Mysore students ::	
* South Indian students	
* Madras Corporation school	and an arrangement
boys	2.11
*Bombay Corporation school	
bovs	2.23
* New York Corporation school	المراجع والمناز المنتاز المناز المناز المناز المناز
bovs	2.21
* Mahratta boys in Bombay	2.15

N.B.—Those marked with asterisks (*) have been worked out by me from the tables of height and weight, recorded in Municipal Health Reports. The Corporation school boys of 12 years of age were taken.

Grip strength

The grip strength of both the hands of students were recorded by means of the hand dynamometer. The grip strength is given in pounds (lb.), vide tables VII and VIII.

TABLE VII

Showing the average grip strength by age for the stronger hand of groups of students who were affected and not affected by vitamin-A deficiency

Age (centre of interval)	Group showing vitamin-A deficiency	Group not showing vitamin-A deficiency
15.0 15.6 16.0 16.6 17.0 17.6 18.0 19.0 19.6 20.0 20.6 21.0	$\begin{array}{c} 113.0 \pm 21.1 \\ 123.3 \pm 18.9 \\ 145.6 \pm 38.4 \\ 147.9 \pm 29.7 \\ 1.74.3 \pm 47.8 \\ 128.8 \pm 12.8 \\ 164.6 \pm 40.3 \\ 155.0 \pm 35.3 \\ 175.8 \pm 55.6 \\ 225.0 \pm 58.0 \\ 184.1 \pm 36.1 \\ 216.7 \pm 41.6 \\ \end{array}$	$\begin{array}{c} 130.0 \pm 43.6 \\ 130.0 \pm 43.6 \\ 150.9 \pm 43.1 \\ 141.7 \pm 33.1 \\ 148.1 \pm 35.7 \\ 173.7 \pm 48.1 \\ 205.0 \pm 36.9 \\ 175.0 \pm 49.3 \\ 207.6 \pm 47.7 \\ 171.4 \pm 29.1 \\ 161.0 \pm 55.0 \\ 202.2 \pm 44.1 \\ \end{array}$
		· · · · · · · · · · · · · · · · · · ·

Comparing the mean strength of the stronger hand for the two groups with and without vitamin-A deficiency, it is found that though in all the ages except 16:6 to 17.0 and 20 to 21, the group without vitamin-A deficiency has stronger grip than the group deficiency, only in the age. 18.0 this difference is statistically significant. Observation on larger number of people may be able to show the difference in the other age

TABLE VIII

Showing the average grip strength by age of both hands for the groups of students who were affected and not affected by vitamin-A deficiency

Аде	Group showing vitamin-A deficiency	Group not showing vitamin-A deficiency
15.0 15.6 16.0 16.6 17.0 17.6 18.0 18.6 19.0 19.6 20.0 21.0	$\begin{array}{c} 102.0 \pm 8.1 \\ 105.8 \pm 23.2 \\ 131.9 \pm 36.8 \\ 133.9 \pm 31.7 \\ 161.8 \pm 38.3 \\ 123.8 \pm 35.8 \\ 154.0 \pm 37.3 \\ 145.0 \pm 28.3 \\ 169.5 \pm 49.4 \\ 209.4 \pm 47.4 \\ 175.9 \pm 35.6 \\ 190.0 \pm 50.2 \\ \end{array}$	$\begin{array}{c} 115.0 \pm 28.2 \\ 153.3 \pm 43.7 \\ 139.4 \pm 37.3 \\ 133.3 \pm 25.2 \\ 132.5 \pm 30.2 \\ 160.7 \pm 46.4 \\ 175.5 \pm 30.1 \\ 169.6 \pm 47.2 \\ 181.5 \pm 43.1 \\ 161.6 \pm 27.2 \\ 149.5 \pm 46.6 \\ 182.2 \pm 31.7 \\ \end{array}$

groups. Similar comparison between the two groups with regard to the average grip strength of both the hands did not show significant result in any of the age groups studied.

Economic status

The students of the Presidency College come mostly from the well-to-do classes in the Madras Presidency. According to the Madras Government's classification of rich, middle and poor classes of society, usually about 10 per cent of the students will be placed in the poor group (parents with an income below Rs. 200 p.m.). It is thus the aristocratic institution in South India. It was a great surprise to note that a large percentage of the students (24.64 per cent) showed signs of vitamin-A deficiency. In tables IX, X and XI the affected students have been classified according to their economic status.

From table IX, it will be seen that in the affected group 57.7 per cent belong to the rich, 20.5 per cent to the middle and 21.8 per cent to

Table IX

Distribution of vitamin-A deficiency according to economic status

		Number affected	Percentage	
Rich Middle Poor	••	90 32 34	57.7 20.5 21.8	
TOTAL	••	156	100.0	1

the poor class. The percentage affected in the combined group and in each class of society is worked out in table X. From this table, it will be observed that the incidence among the poor class is higher than in the other two classes.

TABLE X

Class of society	Affected group (2)	Unaffected group (3)	Both groups (4)	Per cent of the affected to total in column (4) (5)
Rich Middle Poor	90 32 34	30S 91 78	398 123 112	22.61 26.02 30.36
Toral: ALL CLASSES.	156	477	633	24 61

TABLE XI

Distribution of the occupation of parents classified as rich, middle and poor in the affected and unaffected groups of students

(A) Classification of the rich, according to their occupation (an income above Rs. 500 p.m.)

Occupation	Affected number	Unaffected number	Total
	1		
Landlords	27	, 80	107
Merchants	19	80	99
Gazetted officers	18	90	108
Lawyers	11	28	39
Doctors	7	` 17	24
Bankers	4	4	8
Professors	3	4	7
Planter	ĭ	1	1
Engineers		5	. 5
-]	1	
Toru	- 90	308	398
	* *******		1

(B) Classification of the middle class-according to their occupation (an income between Rs. 200 and Rs. 500 p.m.)

Occupation	Affected number	Unaffected number	Total
Pensioners Managers in offices Accountants Non-gazetted officers Ryots (agriculturists) Engine drivers Stevedore Goldsmith Pressmen and editors Nil occupation	7 6 6 5 4 2 1	27 11 12 18 6 4 13	34 17 18 23 · 10 · 2 · 1 · 1 · 4
Тотль	32 (26.02%)	91 (73.98%)	- 123

Comparing the proportion of the students deficient in vitamin A in the three groups of rich, middle and poor, it is found that though statistically the difference is not significant, still there is a regular gradation in the proportions, the lower class economic group containing larger proportion of the students showing vitamin-A deficiency.

(C) Classification of the poor according to their occupation (an income below Rs. 200 p.m.)

Occupation	Affected number	Unaffected number	Total
Teachers Clerks Fitters Tailors Carpenters Coolies Photographer, Cook, Gardener, Sculptor,	8 6 3 2 2 2 2	18 46 3 1	26 52 6 3 2
Barber, Musician, Book-binder and Draftsman—e a c h one incidence— Total Priest Foreman Mason, Compositor, Dyeing Master, Riveter, Typist, Optician, Amin	8 1 1	2 1	8 3 2
(law process server) —each one inci- dence—Total		7	7
Military Indian warrant officer.	1		1
Total	34 (30.36%)	78 (69 64%)	112

Dietary habits

Since all classes of students were affected, the following additional information was gathered:—

- (i) the dietary habits of the students; and
- (ii) whether the students were messing at home or in hostels, or in public hotels.

The data collected are presented in table XII.

Table XII

Distribution of affected students

Residence		Number	Per cent
Home-fed students	••	132	84.6
Hostel-fed ,,		23	14.8
Hotel-fed ,,		1	0.6

The figures indicate that the home-fed students are the worst sufferers.

On further enquiry, it was elicited that even the well-to-do classes have not been able to get casily foodstuffs such as fresh milk and milk products (pure butter and ghee), fats and oils, vegetables and fruits. They have had to use instead hydrogenated oils, skimmed milk powder of different makes and an insufficiency of fruits and vegetables. Even rice which is the staple diet of the Madrassi was of inferior quality and was obtained during the war years in insufficient

amounts. The prices of most of these articles were also very high and beyond the means of the poor and middle classes. Even the rich got them sparingly only.

Although from the enquiry it is not possible to say exactly what item in the dietary was responsible for the causation of vitamin-A deficiency, it is believed that the general lowering of the quality and quantity of foodstuffs taken, particularly with respect to milk, butter and ghee, and the increasing tendency to use skimmed milk and hydrogenated oils as substitutes in their places, were in all probability responsible for the increased incidence of vitamin-A deficiency.

Discussion

The students of the Presidency College, Madras, generally come from the well-to-do classes. Their parents can well afford to provide a balanced or an adequate diet to meet the nutritional requirements of their families. The majority of students feed in their own homes, and only a small percentage mess in hostels and hotels. Despite these facts, the incidence of vitamin-A deficiency among the Presidency College students is quite high. Although the incidence is significantly higher in the poorer classes, the rich and the middle classes are by no means exempt. This needs to be accounted for.

The war reduced markedly the availability of good fresh foods. The prices also soared up high, and the poor suffered more than the rich by these changes. The poor had to be contented with smaller quantities of inferior quality of foodstuffs. The rich, while being able to buy sufficient quantity of foodstuffs, had to be contented with inferior quality or substitutes, which are known to be lacking in some of the vital proximal principles of food.

To these factors may be added the factor of ignorance about the nutritive value of foodstuffs, and of what constitutes a balanced or an adequate diet; and also the lack of interest in his own health problems. This ignorance is not confined to the poor classes but it is also prevalent among the rich. The richer classes frequently purchase the highly advertised tinned foods, which in most cases are deficient in one or other of the vital proximal principles. They do not buy wisely the food needed for the body.

If even in normal times the Madrassi food is reputed to be defective in proteins and fats, it is not surprising that under the altered conditions of war and post-war years, their dietary deteriorated further in quality, particularly with respect to fats and vitamins. This low intake of fats and vitamin A is reflected in the high incidence of vitamin-A deficiency. This not only affected the poor but also the middle and rich classes, though to a lesser extent.

If the above explanation for the increased incidence of vitamin-A deficiency is accepted, the remedy for correcting the situation lies in the adoption and practice of a wise and thorough

nutritional policy by the State.

Malnutrition exists in the population chiefly because of inadequate income, poor and bad food habits, unavailability of proper foods, physiological stress without adequate increase in food and metabolic disorders and diseases which interfere with the digestion and absorption of foods.

The poor food habits are due to ignorance about the nutritive value of foodstuffs, indifference in serving nutritious dishes, selection and preparation of foods. It has been shown by research workers that the nutritional value of food declines during transit from one place to another unless properly preserved. storage in the market is as important as proper preparation in the kitchen. One can get better nutrition by using whole grain, by choosing fresh vegetables, by using a minimum of water in cooking, by consuming the pot liquor of vegetables in a soup, by cooking rapidly, and by consuming foods soon after cooking. Just as illiteracy is being greatly reduced by adult education, so also malnutrition can be significantly reduced by mass education of the people on the selection of proper foods. The correct knowledge should be imparted not only to the consumer but also to the grocer and the producer. Laws should be enacted for controlling mass production and sale of food. These can only be satisfactorily done when the State undertakes the responsibility. Individual effort can achieve but little.

Summary and conclusions

1. Six hundred and thirty-three students of the Presidency College, Madras, were medically examined in 1947-48 and 156 of them found to have vitamin-A deficiency.

2. An analysis of the affected group of students showed that they belonged to the rich, middle and poor classes the last suffering most

middle and poor classes, the last suffering most.

3. An investigation into the cause for this high incidence revealed that it is probably due to the lack of fresh foods, especially milk, butter, oils, and fruits, and also to the increasing intake of hydrogenated oils, skimmed milk powder, and tinned foods of inferior quality.

Acknowledgment

I am indebted to Mr. K. K. Mathen, Assistant Professor of Statistics, All-India Institute of Hygiene and Public Health, Calcutta, for his helpful notes on the statistical portion of this article.

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The Indian Medical Gazette fifty Years Ago

THE STUDY OF TROPICAL DISEASES (Reprinted from the *Indian Medical Gazette*, Vol. XXXIII, September 1898, p. 343)

The increasing interest taken by the people of England in everything concerning the tropics is significant and full of promise. It is in part due to the mind-expanding effect of travel upon the annually increasing number of our coldweather visitors, but it is also in part due to the restless energy of the returned or retired tropical residents. Men retire at an earlier age and with better health than formerly, and are less willing to settle down to a quiet club life for the rest of their days. A run home on short leave is also more possible, and the result of all this is that the galling neglect and careless indifference of former days is giving way to an almost feverish interest in Indian affairs—scientific as well as political. And provided that half assimilated facts, or even erroneous views do not replace the ignorance that existed, the change can only be for the better, and so far is one to be warmly welcomed.

One of the chief evidences of this awakening interest in matters scientific is the formation of a section of tropical medicine at the annual meeting of the British Medical Association held in Edinburgh in July last. Another is the attempt to start a school of tropical medicine at Greenwich, and a third is the New Journal of Tropical Medicine, the first number of which has just been published in London. Men who are working in the tropics will probably still prefer to see the results of their labours appear without delay in medical journals published near the seat of their labours, but for work in tropical diseases, such as can be carried on in temperate climes, the new journal will no doubt form a suitable medium of publication. We offer our new contemporary a warm welcome in the wide sphere open to it.

As regards the teaching of tropical diseases in London, it appears from the Lancet that the Committee of the Seamen's Hospital at Greenwich has placed before Mr. Chamberlain a scheme for enlarging the branch hospital at the Albert Docks from eighteen to forty-five beds, in order to supply the material necessary for teaching. Sir Henry Burdett has written to The Times (11th July) supporting the scheme, and that paper has also a leading article upon his letter. In addition to the enlargement of the branch hospital of the docks, the scheme includes, according to the Lancet:—

The building of school premises, museum, and laboratory, with accommodation for from twenty to twenty-five students, of whom ten

would be able to sleep on the establishment. A medical tutor is to supervise the instruction for six hours daily, whilst the staff of the Seamen's Hospital as well as of the branch hospital, with specially selected additional teachers, are to attend and teach for four hours a day during four days a week. We see no provisions in Sir Henry Burdett's letter for the payment of this staff of teachers. It can scarcely be expected that the physicians and surgeons attached to the Seamen's Hospital Society can undertake any more gratuitous work than they have at present. The Albert Docks is not a very accessible place and a visit there, with four hours' teaching, will make a serious inroad into a physician's or surgeon's daily work. The study of tropical diseases is of the utmost practical importance for colonial and military surgeons and practitioners, and deserves every encouragement. Hitherto it has been best carried out at Netley, and the amount of practical material in that hospital for such a study must not be ignored, although it is only at the disposal of the Indian and army medical officers. Sporadic courses of lectures in London are eminently unpractical, because the students cannot watch the course and treatment of the cases illustrating the lectures. Few patients can be brought from Greenwich or the Albert Docks to a metropolitan school, and few students will regularly visit either of these institutions. Sir Henry Burdett is sanguine that tropical diseases can be thoroughly studied at the Docks, and on behalf of the Seamen's Hospital appeals to the public for £10,000 and a net income of £2,000 a year, in addition to a capital grant of £3,550 from the Colonial Office and the fees from Colonial students, estimated at £1,000 per annum. We see no statement as to the number of tropical cases which are admitted into the hospitals of Seamen's Hospital Society. dysentery, beri-beri, and chronic malaria make up almost entirely the tropical diseases which a student may expect to see during a course of three or four months' study, and acute cases must be extremely rare, judging from the annual reports of the Society. Mr. W. Johnson Smith has published the records of the cases of hepatic abscess during twenty-five years, and they only amount to fifty. Bacteriological investigation in tropical diseases can be taught in the wellappointed laboratories of many of our medical schools and is a part of the Netley curriculum. Phthisis, cardiac disease, rheumatism, and renal disease figure amongst the most common cases of illness at the Seamen's as well as at other hospitals. If compulsion is exercised on applicants for Colonial medical appointments, as seems to be implied in Mr. Chamberlain's letter, of course a regular supply of students will be at once forthcoming; but if there is no compulsion we question whether many will attend at such an inaccessible situation as the Albert Docks, and we doubt whether the variety of cases is sufficient to interest and instruct them'

for such a long period as three or four months'. Since the appearance of Sir Henry Burdett's letter in The Times, the Visiting Physicians, Drs. John Curnow and John Anderson, C.I.E., and the Visiting Surgeon, Mr. G. R. Turner, have written to the Lancet, saying that the letter in The Times was the first intimation of any kind they received that such a scheme was on foot, and that the statement was made without their authority or consent. The visiting staff of the Branch Hospital of 18 beds (the Seamen's Hospitals contain 235 beds) are: Physician, Dr. P. Manson, and Surgeons, Mr. W. J. Smith and Mr. W. Turner. The state of affairs hinted at in our London Letter of this issue seems therefore to exist. In a question of this kind, however, personalities should be ignored and the abstract question—is or is not a school of tropical medicine possible or necessary in London ?-should alone be considered.

In the truly modest appeal to the public quoted above, the fact that the proper place to study tropical diseases is in the tropics seems to be lost sight of. It may be said, and we are quite prepared for the reproach, that medical men in hot climates have not done very much to advance pathology. This is true and yet not true. True of the majority of men who are overworked and have no time or superfluous energy for original work, but untrue of those who have either. The names of Lewis, Cunningham, Vandyke Carter, Maitland, Ross and many others will live, and were time as well as opportunity given, the list would be

rapidly added to.

Acute rheumatism is a disease prevailing in England and its after-effects are commonly seen in India. Yet no one dreams of coming from England to India to study acute rheumatism. Even a profound acquaintance with chronic ' tropical ' dysentery, enlarged spleen and diarrhœa at home will avail one little in treating acute dysentery, heatstroke, cholera or remittent malarial fever as met with daily in the tropics. The material in London is, we hold, too small in amount and of the wrong quality for teaching purposes. Even if it were not, however, the necessity of such a school remains to be proved. Similar material is to be found in even greater abundance in the Royal Victoria Hospital at Netley, where too there exist a medical school with well-equipped laboratories and a teaching staff well acquainted with tropical diseases of all kinds. There is an excellent museum with specimens of every disease prevailing in warm climates, and in addition the hygiene teaching and laboratory are as good as are to be found anywhere. The cost to the State and to the individual would probably be less also than in the Albert Dock School. Nothing need be said of the far-reaching advantages of the professional and social intercourse between the future members of the R.A.M.C., the I.M.S. and the Colonial Medical Service. They are obvious.

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Indian Journal of Medical Research

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THACKER, SPINK & CO. (1933), P. O. Box 54, CALCUTTA

As we have already urged, however, the best place to study tropical diseases is in the tropics, and we would like to see men sent to conveniently situated cities possessing large hospitals and, if possible, medical schools, such as Bombay, Calcutta, Jamaica, Hong-Kong, etc. Three months spent there before proceeding to join their appointments would be invaluable. For the British and Indian Medical Services also a return to the old system of spending a few months in the presidency-towns on first arrival has very much to recommend it. Besides learning a great deal practically about tropical medicine in the time so spent, men gained time to study the language and know something of official life. The heads of the service had an opportunity of learning of what stuff the new arrivals were made, and the men themselves often formed friendships of life-long value. fostering an esprit de corps which is even more desirable to-day than ever it was.

Under the conditions that will obtain at Greenwich if the school is started, men will learn what they should have learned before they qualified, how to examine blood and faces for the malarial and other parasites and for worms. Beyond that and obtaining a practical knowledge of a few chronic tropical diseases with a theoretical knowledge of the rest, we cannot see what advantage a man will gain from his three months' residence at the Albert Docks.

Current Topics, Etc.

The Treatment of Peptic Ulcer with Special Reference to Vagotomy

By J. M. RUFFIN and

R. C. SMITH

(Abstracted from the American Practitioner, Vol. 1. November 1946, p.-148)

The usual medical and surgical treatment will benefit most cases but not all. Vagotomy is indicated in patients with intractable ulcer, whether gastric or duodenal, in patients who have had repeated massive hamorrhage and particularly in patients with marginal ulcer. Certainly the procedure should not be employed in simple, uncomplicated ulcer, nor in patients with pyloric obstruction unless preceded or accompanied by a gastro-enterostomy or pyloroplasty. If there is any suspicion of malignancy, the procedure should not even be considered. While one hesitates to draw sweeping conclusions with the data at hand, still it would seem that vagotomy is the best answer that has yet been offered to the medical profession in the treatment of chronic or intractable peptic ulcer.

The trans-thoracic approach was employed in order to obtain a more complete section of the vagus nerves and their branches about the lower esophagus. The incision is made through the left chest wall about the midaxillary line. The thoracic cavity is opened through the bed of the left eighth or ninth rib and the lung retracted. The pleura over the posterior mediastinum is opened and the lower esophagus and vagus nerves

mobilized. The two nerves and their branches are removed from the level of the hiatus of the lung down to the diaphragm and the lower ends allowed to retract into the abdominal cavity.

The most striking result of this operation has been the immediate, complete, and, to date, permanent relief of pain in every case. There has been no recurrence of homorrhage or vomiting of any consequence since operation.

Evidence of complete healing of the ulcer was noted in every case in which satisfactory postoperative studies

were obtained.

While one cannot be certain at the present time, still the writers' studies would indicate that the decrease or absence of gastric motility is the most likely explanation for the immediate and complete relief of pain and apparent healing of the ulcer rather than changes

in gastric acidity.

Reviews

HANDBOOK OF COMMUNICABLE DISEASES.—By Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P. Second Edition. 1947. The C. V. Mosby Company, St. Louis. Pp. 992 with 95 illustrations and 13 coloured plates. Price, \$9.50

In this edition the book has been revised and enlarged with fourteen new chapters which include theumatic fever, primary atypical pneumonia, infectious hepatitis, chancroid, etc. The book covers a wide field of communicable diseases ranging from scables to pneumonia. Syphilis, gonorrhea, tuberculosis and pneumonia have been treated at some length owing to their special importance. It is well lillustrated and presents the clinical features of diseases with their prevention, treatment and nursing care in a clear and concise style.

Two valuable chapters are on nursing management in hospital and in the home. Writing on malaria Coggeshall mentions chloroquin as a valuable drug in this disease, which incidentally accords with our own experience. In outlining the modern treatment of syphilis Dr. Shafter rightly stresses the fact that penicillin is still in the experimental stage and that to-day's schedules may become obsolete to-morrow. In the treatment the author recommends a high caloric diet. In the chapter on poliomyelitis details of physiotherapy have received special attention. This is a good book which students and practitioners alike can read with benefit.

R. N. C.

MEDICINE: ESSENTIALS FOR PRACTITIONERS AND STUDENTS.—By G. E. Beaumont, M.A., D.M. (Oxon.), F.R.C.P., D.P.H. (Lond.). Fifth Edition. 1948. J. and A. Churchill Limited, London. Pp. xvi plus 831, with 71 illustrations.. Price, 30s.

This book first published in 1932 has now passed through five editions three of which were reprinted and one translated into Spanish. Such is the popularity of the book.

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. hypoglycemia treatment'; 7 recovered, 13 were improved and 9 remained unchanged.

R. N. C.

THE TWELFTH ANNUAL REPORT OF THE COIMBATORE DISTRICT TUBERCULOSIS SANATORIUM SOCIETY FOR THE PERIOD 1ST APRIL, 1947, TO 31ST MARCH, 1948

DURING the year under review altogether 411 patients were treated. Out of 218 cases of pulmonary tuberwere treated. Out of 218 cases of pulmonary tuber-culosis 80 improved, 87 were stationary. 35 became worse, and 16 died. Some buildings were completed and new wards opened. On account of high prices the expenditure has increased very much.

R. N. C.

Correspondence

OBSERVATIONS ON PNEUMOCOCCAL MENIN-GITIS AS A COMPLICATION OF KALA-AZAR

SIR,-With reference to the article 'Observations on Pneumococcal Meningitis as a complication of Kalaazar' by Dr. Sen Gupta and others, January 1948, Vol. 83, I like to draw the attention on the following points:

Case 1.—After the sternal puncture was done on the 29th September, 1945, and Leishmania found the patient was put on specific treatment for kala-azar with intravenous injections of aminostiburea on consecutive days. But on the evening of the 7th October, 1945, the patient suddenly developed high fever and became unconscious.

Case 2.—The specific treatment for kala-azar was commenced on the 25th March, 1946, and only one injection of stibatin given on that day. During the same night the patient had high temperature and convulsions and became unconscious.

Case 4.—On the 11th December, 1946, specific treatment for help against the patient and convergence of the same with patients.

ment for kala-azar with pentamidine was commenced. The same evening the patient complained of severe headache and had a rise of temperature up to 101°F.

Has the specific treatment any relation with the onset

of meningeal complications?

10, MAC. HOUSE, C/O SERAMPORE COLLECE, SERAMPORE, 14th June, 1948.

Yours, etc., N. K. BASU, MAJOR, I.M.S. (late).

IIt is extremely unlikely for the specific treatment (as given) to cause pneumococcal meningitis.—P. S.J.

COMATOSE CONDITION DUE TO B.T. INFECTION

Sir,—I herewith enclose two slides of blood smear, one thick and one thin, of B.T. malaria parasites. These are from a case of cerebral malaria in a young girl about 18 years old. She was pregnant about 8 months and gave history of attacks of fever for about 8 to 10 days. When seen she had high fever and deeply comatose. She died after 2 days because the parents would not allow treatment by injection.

The interest of this case lies in the fact that comatose condition due to B.T. infection is. I believe, not recorded.

COTTAGE HOSPITAL, DAKOR (DIST. KAIRA).

Yours, etc., P. N. JOSHI.

[This blood film is very interesting. It shows fairly large numbers of B.T. parasites at different phases. In addition, there are a number of M.T. parasites as ring addition, there are a number of M.T. parasites as ring forms with Maurer's dots, growing trophozoites, growing schizonts and mature rosettes—all with black compact masses of hæmozoin pigments, which the correspondent must have failed to identify or missed. These developing phases of M.T. parasites grow in the internal capillaries and are, therefore, not usually seen in the peripheral blood film. In heavy infections, usually accompanied by coma, the internal capillaries are so full that an overflow into the peripheral blood takes place (as has happened in this case) thus showing the different phases in peripheral blood film .- S. S.1

Any Questions

OPHTHALMOLOGICAL TRAINING

Sir,-I have passed the L.M.P. examination of State

Medical Faculty of Government of Bombay, Now I want to do the special course in ophthal-

mology. I shall be much grateful if you will inform me about the name of any medical college or hospital recognized for that diploma and whether I can join or not.

46, COTTON CHAUK, PANJALAPOLE, AHMEDABAD. Yours faithfully, NATHALAL P. SHAH, L.M.P. (Bom.).

[Only Madras has a diploma of Licentiate in Ophthalmology (L.O.) where medical licentiates are admitted.—Editor, I.M.G.1

MEDICAL BOOKS

Sir,—I shall be very grateful if you kindly provideme with the following suggestions:—

1. Name of best book for guiding to laboratory works (specially regarding blood, urine and stool examination).

Name of best book in bacteriology.

Reliable firms whose chemical products forlaboratory purpose should be used.

PURNEA. 24th August, 1948. Yours faithfully, K. R. DATTA.

[(1) Clinical Methods. By Robert Hutchison and Donald Hunter. Cassell and Co., Ltd., London.

(2) Handbook of Practical Bacteriology. By T. J. Mackie and J. E. McCartney. Eighth Edition. 1948. E. and S. Livingstone Ltd., Edinburgh, for satisfying the physician's interest in

bucteriology, and
Topley and Wilson's Principles of Bacteriology
and Immunity. By G. S. Wilson and A. A.
Miles. Third Edition. Vols. I and II. 1946.
Edward Arnold and Co., London, for authoritative opinion and for subjects for original work

(3) Any reliable firm of chemists.—Epitor, I.M.G.1

Service Notes

APPOINTMENTS AND TRANSFERS

LIEUTENANT-COLONGL P. C. DUTTA is appointed Civil Surgeon, Simla East and West, and Officer-in-Charge, Civil and Military Dispensary, Simla, with effect from the afternoon of the 14th August, 1947, vice Lieutenant-Colonel B. Temple-Raston.

Lieutenant-Colonel M. L. Ahuja is confirmed in the

post of Director, Central Research Institute, Kasauli, with effect from the 15th August, 1947.

Dr. C. V. Ramchandani is appointed temporarily as Assistant Director-General of Health Services (Public Health Measures), with effect from the afternoon of the 12th June, 1948.

Dr. P. L. Nirula. Assistant Director-General of Health Dr. F. L. Initual, Assistant Director-General of Health Services (Public Health Measures), is appointed temporarily as Director. Refugee Medical Relief in the Dte. General of Health Services, with effect from the afternoon of 12th June, 1948.

Mr. S. B. Kher, Assistant Stores Superintendent, Medical Store Depot, Bombay, is appointed as Assistant Depot Manager Medical Store Depot, Rombay, on a

Depot Manager, Medical Store Depot, Bombay, on a

purely temporary basis, with effect from the forenoon of 10th November, 1947, vice Mr. S. Siva Rao

transferred. Mr. D. Rajan, Assistant Depot Manager, Lahore Cantonment, is transferred as Factory Manager, Medical Store Depot, Bombay, with effect from the forenoon of 31st May, 1947, vice Mr. S. K. Borker, transferred as Assistant Drugs Controller, New Delhi.

The undermentioned officers are appointed in the Medical Store Depots to the posts mentioned against their names under the provisions of the Government of India, Ministry of Health Letter No. F.12-42/46D, dated the 19th July, 1947, on a purely temporary basis from the dates indicated:-

Madras

Mr. D. A. Rama Wariyar, Depot Manager. Dated

24th March, 1947.
Mr. S. J. Bhashyam, Assistant Depot Manager.
Dated 24th March, 1947.

Mr. S. P. Henry, Assistant Depot Manager. Dated 10th April, 1947.
Mr. G. B. Naidu, Factory Manager. Dated 24th

Mr. G. B. Naidu, Factory Manager. Dated 24th March, 1947. Mr. K. P. Balakrishna Pisharoty, Assistant Factory Manager. Dated 24th March, 1947.

Mr. M. G. Pandit, Depot Manager. Dated 24th

March, 1947. Mr. S. S. Rao, Assistant Depot Manager. Dated

24th March, 1947.

Mr. B. N. Savant, Assistant Depot Manager. Dated

1st April, 1947.
Mr. S. K. Borkar, Factory Manager. Dated 24th

March, 1947.
Mr. P. Y. Kulkarni, Assistant Factory Manager. Dated 24th March, 1947.

Calcutta

Mr. S. K. Mustafi, Depot Manager. Dated 24th March, 1947.

Mr. S. N. Chakraborty, Assistant Depot Manager. Dated 24th March, 1947.

Lahore Cantonment

Captain M. C. Sharma, Indian Army Medical Corps Depot Manager. Dated 24th March, 1947. Mr. D. Rajan, Assistant Depot Manager. Dated 24th

March, 1947. Mr. Ijaz Hussain, Assistant Depot Manager. Dated

The undermentioned officer of the I.M.S. (E.C.) reverts from the R.I.A.F., and is seconded to the I.A.M.C.

F/Lieutenant R. Singh Rao. Dated 11th July, 1947.

LEAVE

Subedar Major and Honorary Lieutenant (Ty.) B. N. Lahiri, attached to the Central Research Institute, Kasauli, is granted leave on average pay for 4 months pending retirement with effect from the 15th May, 1948 (forenoon).

PROMOTIONS

Captain to be Major

C. F. Garfit. Dated 1st August, 1941.

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commissions)

Captains to be Majors

M. G. Hyder. Dated 3rd July, 1947. S. C. Nath. Dated 7th August, 1947.

RETIREMENTS

Lieutenant-Colonel P. D. Chopra, 23rd May, 1946, and is granted the honorary rank of Colonel.

Lieutenant-Colonel J. Chandra, O.B.E., 4th December, 1946, and is granted the honorary rank of Colonel.
Lieutenant-Colonel B. G. Mallya. Dated 11th August, 1946.

RELINQUISHMENTS

The undermentioned officers are permitted to relinquish their commission on release from army service and are granted the honorary rank of Captain:-

INDIAN LAND FORCES-INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commissions)

Venkatachalapathi. Dated Captain Ramaswamier

26th April, 1946. Captain Kumbakonam Srinivasa Rao Sarangapani.

Dated 31st August, 1946. Captain Arthur Blackmore Philip. Dated 4th May.

1946. Captain (Mrs.) Rajrajeshwari Devi Karki Pahwa.

Dated 2nd November, 1946. Captain Sudhir Kumar Chakrabarti. Dated 20th

October, 1946.

The undermentioned officer is permitted to relinquish his commission on grounds of ill health and is granted the honorary rank of Major :-

Indian Land Forces-Indian Medical Service SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Major Nirmal Krishna Basu. Dated 2nd January, 1947.

The undermentioned officer is permitted to relinquish his commission on release from army service and is granted the honorary rank of F/Lieutenant :-

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS

(Emergency Commission)

Captain Gomatam Raghavachari. Dated 25th July. 1947.

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The Editors of The Indian Medical Gasette cannot advise correspondents with regard to prescriptions diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette

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Original Articles

LIPOMAS, BIG AND SMALL

By M. G. KINI, M.B., M.ch. (Orth.), FR.C.S.E., FA.C.S., FRSE., F.N.I., FASC.

In 1933, a child aged 7½ months was brought with a big swelling in the armpit with a history that at birth it was small but in the course of a month before admission it suddenly began to grow in size (figure 9, plate XXV).

Clinically from its lobulated appearance and its size in the region of the armpit it was diagnosed to be a case of lymphoid sarcoma (congenital in origin). At operation it was found to be firm, opaque and yellowish white in colour with fair sized blood vessels. On dissection it was found to be attached to the main blood vessels and was carefully removed. After removal it was found to be a lipoma. The pathologist stated that it was a lipoma with peculiar polyhedral cells packed with granules with a central nucleus. This case evoked a lot of interest in lipomas, and after this every case that was seen was recorded and photographs were taken wherever possible. Thus has originated this paper.

It is interesting to note that it is calculated that adipose tissue forms 18 per cent by weight of a normal individual of average nutrition.

Neoplasms of adipose tissue have attracted least attention. The pathologists are quite happy when they see a specimen of lipoma sent for pathological examination. A prompt report that it is a lipoma is sent. The surgeons are content because it is a tumour which is easily removable. The interest of the surgeon and the pathologist is naturally directed to abnormal types of lipomas such as heteroplastic lipomas occurring in the periosteal and meningeal regions or to lipomas that undergo malignant changes. This tissue has been classified by pathologists for a long time as a connective tissue with a lot of fatty material (Fleming).

It must have been a matter of common observation by surgeons that when the omentum gets obstructed in inguinal hernias, it forms a lumpy structure similar to lipoma by becoming lobulated. It is however paler in colour than the normal omentum.

Cellular pathology of Virchow held the field from 1853 to 1870. This was challenged by Toldt who stated that the fatty tissue is a special primitive organ with special vascularization and having a lobular structure with the power to store and give up fat. Hammar Chiari and Inglis held that there were two types of adipose tissues both derived from primitive connective tissue. Wassermann held that it was a primitive fatty tissue formed from the same embryonic

as the lymph nodes, capillaries, element reticular cells and the vascular adventitia subject to reversible changes from fatty to lymphoid and from lymphoid to fatty tissue, see legend and figure 25, plate XXVIII. It is stated in this case that she had a lot of lymphatic ædema of the arm and after the lymph ædema disappeared a small node remained on the antero-lateral aspect of the arm which began to grow. On excision it was found to be a lipoma. A medical student observed on himself small nodes along the course of the superficial veins in the forearm after attacks of filarial lymphangitis and one of the nodes removed for biopsy examination showed that it had a fatty structure. Cases nos. 20 and 26 gave a history of frequent attacks of pain and swelling. Later a permanent swelling appeared which in the case of no. 20 began to increase in size and became pedunculated. At operation it proved to be a lipoma. In case no. 26 if remained a small lump which proved to be a lipoma during operation. Probably these cases illustrate the views of Wassermann.

Fatty tissue in certain situations has its peculiar type of development and growth. This is best illustrated by the case reported by Standberg. A girl had burns and had a whole skin graft done on her head. The graft was taken from the abdominal wall and when the girl began to grow up the graft began to have an extraordinary deposit of fat corresponding to the deposit in her abdominal wall. This caused a lot of ugliness and discomfort to the patient from the æsthetic point of view. This is an illustration to show that the growth and development of fat is different in different aspects of human anatomy.

Relation to endocrine gland has been suggested by the observation of fatty changes that take place in the involuted thymus. The vacuolated cells of the adrenal cortex rich in lipoids show this relationship. . The development of estrogens from lipoids (cholestrine derivative) is further proof of the relationship of the endocrines to the fatty tissue. Hibernating gland is an example of this sort. In certain races, in women, heavy deposit of fat occurs in certain situations especially in the region of the buttocks as in Hottentots and Bushmen. This abnormality is considered to be of æsthetic value from beauty standards obtaining among these types of people. Even this decoration reacts to demand and gives up fat during emaciation unlike the child's suction pad in the cheeks.

Altered secretions cause fatty deposits as in the case of adiposis dolorosa and in Frohlich's syndrome. If the fat is the storehouse for liberation when required it is noticeable that lipomas remain without alteration in size even though heavy demand is put upon the storehouse of fat during emaciation.

In recent times Gideon Wells has opened a new line of thought on this subject.

Clinical features

Lipomas are tumours composed of fatty tissue. In their gross appearance they are firm and rounded and usually are multilobulated growths held together by connective tissue. There is no regular encapsulation but there is a well-marked condensation of tissue which is very loosely connected with the tumour itself. In addition there is a delicate capsule which envelops the surface of the tumour and is continuous with the areolar tissue holding together the lobules of fat. Their sizes may vary from a pea to masses weighing many pounds. Large tumours cause a lot of inconvenience due to their pressure and weight. Secondary changes may occur lipomas which alter their normal consistence by an admixture of fibrous tissue or by metaphasic changes. In some cases they become pendulous by constriction of the pedicle, the colour is usually that of normal fatty tissue but xanthomatous type may yield an orange yellow colour. Lipomas usually have a main nutrient blood vessel with branches which lead to the lobulations and are easily dissected out during These are usually subcutaneous. operations.

The tumours are usually soft and have to be differentiated from cystic tumours especially sebaceous cysts.

By careful palpation of the margin of the tumour, it is possible to distinctly feel a rounded edge which slips away from under the finger and when this sign is present it serves to distinguish it from cystic tumours.

Sometimes the skin over the tumour is slightly dimpled at one or more points and if this is not quite apparent the dimples are exaggerated by grasping the tumour and pressing it up so as to stretch the skin over it. These dimples usually are caused by slight traction exerted over the skin by the fibrous bands passing from the cutis to the capsule of the tumour between the

It is suggested that by the insulating character of fat, the tumour region is cooler than the site away from the tumour or the corresponding area on the other side. This test has been found to be of some value and has been tested by the Dermolar apparatus which shows delicate variations in temperature.

histopathological picture of lipoma The shows cells distended with fat and in some cases the cells may be polyhedral in character with granular cytoplasm and a central nucleus.

Heteroplastic lipomas are of academic interest such as lipomas in abnormal situations mentioned before. Lipomas associated with blood vessel tumours vary depending upon the type of hæmangioma mixed with this. Some are nævolipomas while others are lipoma cavernosum.

$\mathcal{E}tiology$

It is not known what actuates the development of a lipoma. It is found that it is sometimes hereditary and sometimes occurs in places where the organs are undergoing atrophy as in the kidney, breast, thymus, bone marrow and the lymphatic system.

Multiple lipomas have been found in cases of obesity, in alcoholism and in some cases of elephantoid condition of the leg (see legend and figure 15, plate XXVI). Overgrowth of fatty tissue occurs in mixed tumours and in teratomas giving rise to lipomas. Sometimes lipomas are found associated with neurofibromas.

The legends attached explain the types of cases indexed and photographed. More cases have been seen but only those which are of interest are recorded for purposes of this paper.

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LIST OF ILLUSTRATIONS

Figure 1, plate XXIII.—Small tumour in the forehead which was soft and was of 4 months' duration. The patient sought advice for the disfigurement. The fumour was removed and was found to be a case of small lipoma.

Figure 1a, plate XXIII.—Lateral view of figure 1.

Figures 2 and 2a, plate XXIII.—A big tumour in the region of the right temple and a pendulous one in the right cheek. It was soft, lobulated and was found calcified in places. At operation, it was found that there was a connecting bridge between the lipoma in the region of the temple and the cheek. It caused a lot of disfigurement for which the patient sought admission. It was removed and was found to be a case of lipoma.

Figure 3, plate XXIII.—A soft tumour in the region of the cheek. It was rounded and could be easily mistaken for a parotid tumour. Tumours in the region of the cheek are peculiar and are not uncommon as is illustrated. It must be remembered that in the child there is a sucking pad of fat. It is well known that this pad is not absorbed even when fat, in other situations is absorbed even when fat in other situations is absorbed during emaciation. Sequestration of primitive fat cells occurs in the region of the canine fossa or the inner surface of the Masseter muscle. This tumour pushes its way beneath the skin. Figures 2 and 2 illustrate this type of pathology. and 3 illustrate this type of pathology.

Figure 4, plate XXIV.—A case of lipoma in the nape of the neck. Note the smallness of the size.

Figure 5, plate XXIV.—A lipoma with an hour glass constriction in the nape of the neck on the right side. X-ray inset shows the calcification that this tumour had undergone. There is also a postoperative picture.

Figure 6, plate XXIV.—A big lipoma on the back of neck at its root. It started as a small tumour the weight of which was a source of great annoyance to the patient. Apart from this there was no other inconvenience. The duration of this lipoma was over 5 years. It was easily removed and there is no recurrence. The base is constricted. Compare this with figures 7 and 7a.

Figures 7 and 7a, plate XXIV.—Lateral and posterior views showing the lipoma of a fair size. Compare this with figure 6. This is broad based unlike picture described above. It started as a small tumour and gradually began to grow. It proved to be a lipome after represent to be a lipoma after removal.

Figures 8 and 8a, plate XXIV—Lipoma below and behind the angle of the jaw which was soft and might be easily mistaken for a tumour of the parotid. The patient, in order to get rid of it, got it cauterized by a country thermo-cautery by an indigenous tumour specialist resulting in a scar. The tumour began to grow in size. It proved to be a lipoma after removal.

Figure 9, plate XXV.—A big lobulated tumour in the region of the armpit of a child aged 7½ months. At birth it was a small swelling which began to suddenly increase in size. It was firm to the feel and irregularly nodular and was diagnosed as a case of lymphoid sarcoma.

Figure 10, plate XXV.—A big pedunculated tumour in the region of the armpit more in the posterior fold of the axilla. It was firm with large blood vessels and was considered either as sarcomatous on account of the largeness of the blood vessels or that it was a fibrolipoma. It was operated as a fibrolipoma on account of its pedunculated nature and proved to be so.

Figures 11 and 11a, plate XXV.—A big tumour in the right armpit, broad based, circular and with scarring on the surface. The scars are due to the indigenous country thermo-cautery used for curing the tumour. There were big enlarged veins and it was considered to be a fibrosarcoma but proved to be a fibrolipoma after operation.

Figure 12, plate XXV.—A pedunculated tumour arising in the region of the anterior margin of the deltoid just above its insertion. Note the central dilated vein running at the prominence of the swelling. This was considered to be a lipoma and swelling. proved to be so at operation.

Figure 13, plate XXVI.—A rounded swelling near the back of the scapula. This was a soft tumour, cystic to the feel and diagnosed as a case of lipoma and proved to be so at operation.

Figure 14, plate XXVI.—A pedunculated tumour, firm, appearing like a breast in the back in a woman aged 50 years. Note the scars, result of thermo-cautery used for curing the condition. At operation, it proved to be a fibrolipoma.

Figure 15, plate XXVI.—A lipomatous growth in an elephantoid condition. This man had undergone an operation for removal of the glands and elephantoid scrotum elsewhere. Within six months after the operation he developed marked elephantoid condition of the right side of the leg and thigh with lobulated growths and also less marked elephantoid condition on the left side. Nothing could be done for him except perhaps a disarticulation of the affected limb.

Figure 16, plate XXVII.—A broad based, rounded swelling in the back. It was a soft, lobulated structure, cystic to the feel. The diagnosis made was lipoma and proved to be so at the operation.

Figure 17, plate XXVII.—A similar condition as no. 16 but it is getting pedunculated. It was a lipoma of ordinary type.

Figure 18, plate XXVII.—An elongated swelling in the region of the groin in a woman aged 40 years. Started as a small nodule and began to grow in size. Proved to be a lipoma.

Figure 19, plate XXVII, is very interesting. The patient came with a big scrotum with hydroceles on both sides. Big distinct lump below the two hydroceles was found. The skin was not thickened and there were no enlarged glands in the groin. The hydrocele sacs were excised and the testis buried in the groin. The tumour which proved to

be a big lipoma was excised as in the case of elephantoid scrotum.

Figure 20, plate XXVII.-A fibrolipoma which is pedunculated arising from the middle and upper aspect of the thigh. This must have arisen in the femoral triangle and later became pedunculated. A history of frequent attacks of pain and swelling in the femoral region was given. It was excised and proved to be a lipoma.

Figure 21, plate XXVII.—A lobulated structure at the anal margin. It was firm to the feel and the skin was stretched over it and in places was showing signs of healed ulceration. This proved to be a

lipoma at operation.

inpoma at operation.

Figures 22 and 22a, plate XXVII.—A big tumour in the region of the buttocks, firm, broad based, with a history that it suddenly began to grow in size from a very small tumour just below the posterior superior iline spine. The veins were enlarged and it was considered to be a fibrosarcoma but it proved to be a fibrolingment. proved to be a fibrolipoma.

Figure 23, plate XXVIII.—A big tumour in the side of the chest of a child which was small at birth and covered by capillary nævus. As it began to grow in size suddenly they sought surgical advice. At operation it was found to be a case of nævo-tier and the surgical advice. lipoma of capillary type with a mixture of a lot of fibro fatty material.

Figure 24, plate XXVIII.—A circumscribed ball-like swelling just below the supra-sternal notch. It was small for a long time and began to grow gradually. It was found to be soft, cystic to the feel and at operation it proved to be a lipoma.

Figure 25, plate XXVIII.—The patient gave a history of cedema of her arm and afterwards she noticed a swelling on the right side of the arm which began to grow in size. Proved to be a lipoma at operation.

Figure 26, plate XXVIII.—A small swelling on the middle and posterior aspect of the arm in a child which was small for a long time and began to grow for which advice was sought. Clinically it was diagnosed to be a lipoma. The mother gave a history that the child had recurrent attacks of swelling with retrogression. Latterly in that region she noticed a small swelling which persisted. This proved to be a lipoma.

Figure 27, plate XXVIII.—A neurofibroma in which there was a lot of lipomatous structure. The pedunculated nature of the tumour is interesting.

This was excised

Figure 28, plate XXVIII.—A dense keloid disc-like mass on the antero-lateral aspect of the arm. The tumour by the use of a country thermo-cautery. Underneath the keloid there was a lipoma which was removed and skin grafted and radium pads applied to prevent recurrence of the keloid. There is no reply to a letter sent on follow up.

THE EXPERIENCE OF 'AIR EMBOLISM-PLEURAL SHOCK DURING ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS CASES'

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Any one, who has induced artificial pneumothorax in sufficient numbers, must have seen with alarm the sudden symptoms of 'air

embolism-pleural shock' which are the most dreaded of all complications arising during the course of artificial pneumothorax treatment. Fishberg (1932) says '... and everyone who does considerable work in A.P. has met with some accidents'.

Opinions differ, amongst authorities, as to the causation of the symptom-complexes which are associated with air embolism or pleural shock. Some of them are of opinion that all cases are due to pleural shock while others say that those signs and symptoms are due to air embolism of various degrees.

According to Kayne, Pagel and O'Shaughnessy (1939) pleural shock does not perhaps exist. On the other hand, Burrell (1937) is of the opinion that those signs and symptoms are generally not due to air embolism as this is not substantiated by experimental evidences in animals. Again Davies (1933) takes a perhaps balanced view when he says 'experimental work is also hampered by great difficulty in producing air embolism in a healthy animal owing to the collapse of the veins'. In man, when artificial pneumothorax is done for the treatment of the disease; the veins are surrounded by the rigid fibrous tissue, which holds the vein walls open when torn across or lacerated. Similarly, experiments in production of pleural shock are handicapped by the comparative insensitiveness of this nature of healthy pleura as compared to an inflamed membrane. Pleural shock used to be held responsible for the majority of the 'accidents of puncture'. There is no doubt that air embolism is the factor to which must be attributed the great majority, if not all of the fatal cases; but there is also clear evidence that some of the sudden accidents of puncture are due to pleural shock.

This hospital has done considerable work on inducing artificial pneumothorax. The pneumothorax has been induced in a large number of cases and refills have been given to a much larger number. This work has been done either by the staff or by other medical officers under the direct supervision of the staff. The general feeling in the hospital favours the opinion of Mishaps have occurred Davies. occasionally only. "Gas embolism-pleural shock" symptom-complexes of various degrees have so far been seen about a dozen times. In one particular case minor degrees of symptoms were observed on three occasions during refills, and in another, more than three times, during the irrigation of pleural cavity. Rogers (1864) was the first observer to report the case of a child collapsing while its pleural sac was being irrigated. We have done so far more than a hundred cases of pneumoperitoneum with regular weekly refills but we have not encountered any serious accidents. Banyai (1946) has mentioned the possibility of an embolism during P.P. opera-

Amongst our observed cases of accidents during A.P. five cases of sufficient severity are

presented in this paper. All these five cases were among young men between the ages of 20 to 30 years. Matson (Goldberg, 1947) reports that 'gas embolism-pleural shock' symptom-complex occurred 19 times in over 20,000 inflations or attempted inflations, and in two cases was fatal.

Technique

During induction we adopted the following technique:—

Morphia gr. 4 hypodermically is given in every case of primary induction about 15 minutes The syringe with 1 per cent novocaine solution with adrenalin is slowly pushed in through the intercostal space, and, if free pleural space exists, there will be automatic suction of the novocaine solution by the negative pressure of intrapleural space. A few millilitres of the solution are allowed to be drawn in, and after waiting for at least 10 minutes to allow the parietal pleura to be properly anæsthetized, attempt is made to introduce reading. manometer shows correcttechnique we adopted more than a decade ago.

Case records

Case 1.—It was a case of unilateral disease of the right upper lobe. Artificial pneumothorax was induced by a young medical officer in September 1945, whose technique of induction was a little clumsy. After anæsthetization of the intercostal tissues and pleura with 1 per cent novocaine, Saugman's needle (shortbevelled) was used for induction. The operator, most likely, punctured the lung as he went too deep. He retracted the needle a few millimetres and was in the intrapleural space indicated by good fluctuation of the manometer which was -10-7. About 200 cc. of air were introduced very slowly from Lillingston-Pearson apparatus leaving the final pressure sufficiently negative at the end of induction. Within five minutes after induction the patient complained of catching pain near the right costo-phrenic angle, which increased within a few minutes to further The patient's eyes got fixed, pupils were dilated and unreactive, face blanched. He became unconscious within a few minutes and stertorous respiration followed. After a few minutes the respiration changed to Cheyne-Stokes' type, and the face and fingers became cyanosed. An intramuscular injection of 1.7 cc. of coramine (nikethamide) was given, and an effort was made to remove him to the next room where the Drinker's apparatus (Iron-lung) was lying, but before any further effort could be undertaken to save his life he expired.

Case 2.—This case occurred in February 1947, during induction of artificial pneumothorax on the left side while the right lung was already artificially collapsed. The induction was done by one of our associates. We were present at

the time of induction of artificial pneumothorax of the patient.

At the time of induction of primary A.P. left initial pressure was -14-10. About 200 cc. of air was introduced slowly and the final pressure was -10-3. We left the patient comfortable. About 20 minutes after induction the patient complained of severe pain in the left costo-phrenic angle and had dyspnæa. When we arrived we found the patient cyanosed with profuse perspiration all over his body. The breathing became stertorous. Within the next five minutes about 180 cc. of air was withdrawn from the left chest. The initial pressure was -10-7, and -14-10 after withdrawal of air. In spite of cardiac and respiratory stimulants, the patient died within 40 minutes after induction

Case 3.—It was also during induction of bilateral artificial pneumothorax. The other diseased lung was in a good state of collapse. Fortunately this case recovered, though at one time, his condition became almost hopeless. The induction was done by one of us in February 1948. At the time of induction of artificial pneumothorax of the left side the following pressures were noted: Initial =12-3, after induction of 100 cc. of air -8-5. During anæsthetization the pleura was found thickened. There was only very slow automatic suction of novocaine solution when the intrapleural space was reached during anæsthetization. The patient complained of pain in the left chest immediately after induction. His face was pallid and lips and finger tips were blue. He did not lose his consciousness. Pulse 140 per minute, respiration 42 per minute. 100 cc. of air were withdrawn from the left side. The final pressure could not be recorded due to spasmodic forceful respiratory effort. Later 400 cc. of air were withdrawn from the right side. Initial = -10 ± 0 , final pressure =-22-15. The patient was slightly relieved of distress after withdrawal of air from both sides. Blood pressure was taken after one hour and was found to be 110/55 mm. of Hg. After three hours we were informed again that the condition of the patient had deteriorated. The patient was semi-conscious, cyanosed, had occasional twitchings of facial muscles. Blood pressure was 115/65 mm., almost the same as three hours earlier. Oxygen inhalation was begun, cardiac and foot end of the bed was raised sufficiently. Oxygen inhalation in B.L.B. mask was continued and after about 12 hours the patient's condition was much improved, and on the next day he was out of danger.

Case 4.—Departing for the first time from the usual practice of the hospital in using novocaine for both induction and refills, this case of refill was attempted without novocaine in June 1947. The patient was of nervous temperament. The following signs and symp-

toms were encountered that appeared immediately with the puncture of the pleura.

The patient first complained of acute local pain and immediately his eyes got fixed and face blanched. Pulse became rapid and soft. Later clonic contraction of the whole body started and continued for about 2 minutes when an injection of coramine 1.7 cc. intramuscularly was given. He showed signs of extreme exhaustion but he recovered ultimately within half an hour. Blood pressure = 90/55 mm. Hg. was taken about 15 minutes after the onset of symptoms. No attempt to refill was done on that day. But on the next refill was done after usual novocaine anæsthesia without any untoward symptoms. The patient is still continuing refill at intervals of about a fortnight without any local anæsthesia and without any symptoms so

Case 5.—A case of unilateral disease of the right lung, mainly exudative type. The patient was of extremely nervous temperament. Primary induction was attempted in July 1948. Pleura was anæsthetized with 1 per cent novocaine with adrenalin, and the intrapleural space was patent as the novocaine solution was sucked in freely at the level. Almost as soon as the Saugman's artificial pneumothorax needle was introduced, ten minutes after anæsthetization (the pressure recorded was -14-6) the patient started to have convulsions. The needle was instantaneously withdrawn without any air being introduced. Within a few seconds the patient's face was pale and the eyes were rolling. He held his breath for a few seconds and then uttered a loud cry. Then he complained of very severe pain on the whole of the right side of his chest as if it was being pressed in a vice. After a minute or so he started talking incoherently. His pulse was being watched all the time which at first almost disappeared from the wrist but gradually returned, and steadied to about 90 per minute. In the meantime foot end of the bed was raised and cardiac stimulants were injected. B.P. 130/90 mm. was noted after about ten minutes of the onset of the symptom. He continued to talk incoherently for about twenty minutes and then he asked for snuff to which he was addicted to. Immediately after taking the snuff he said he felt slightly better. He then complained of hunger and was given some biscuits and sweets. (It may be noted here that ordinarily he was a voracious eater.) He became normal in about half an hour's time.

Conclusion

From the case records presented, it will be observed that the detailed studies of the signs and symptoms were not possible in most of the cases. Davies (1933) can aptly be quoted here: 'The difficulties are added to by the urgent need to apply some treatment immediately in the endeavour to save the patient's life and the impossibility therefore of making, at the moment of onset, any detailed examination'.

Post-mortem examinations were not possible in the fatal cases as the relatives were against it.

Out of five accidents, four occurred during primary induction, and of these, two occurred while bilateral inductions were being attempted. (The proportion of bilateral pneumothorax to unilateral in our series was about 1 in 40.) We have been informed (personal communication) by two eminent tuberculosis specialists in India, that they too have encountered proportionately more accidents while attempting induction of Alexander bilateral pneumothorax. has also remarked that the accident is so much commoner at the time of the induction than during pneumothorax refills and more common in bilateral than in unilateral pneumothorax.

The symptom-complex of the first two cases (both ended fatally) was due, according to our estimation, to air embolism. Case 3 presented symptoms which were ambiguous. The signs and symptoms of cases 4 and 5 were due to pleural shock, with perhaps a large measure of hysterical manifestation, as well as in the last case. Case 4 was the only one with sufficient severity which occurred during a reinflation.

Summary

- 1. Five cases of accidents due to air embolism or pleural shock during the operation of artificial pneumothorax have been described. Of these four cases occurred during primary induction, two of which ended fatally.
- Incidence of such accidents during primary induction of bilateral artificial pneumothorax was found proportionately more frequent than in unilateral inductions.
- A simple technique of estimating the depth of intrapleural space and proper anæsthetization of parietal pleura during primary induction is described.

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EFFECT OF PENICILLIN ON VACCINE VIRUS AND ITS VALUE IN PURIFICA-TION OF VACCINE LYMPH

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Numerous methods have been tried for reducing the bacterial count of calf lymph without diminishing its potency. Gins (1924) and Lehmann (1937) have used carbolic acid as an agent for the destruction of bacteria in lymph. Stevenson and Butler (1936) drew attention to the value of phenol as an agent for preventing accidental contamination of lymph. They found that lymph made up into 50 per cent glycerol containing 0.5 per cent phenol retains its potency better than lymph made up in 50 per cent glycerol containing 0.1 per cent clove oil. The method followed at this Institute is to prepare lymph in 50 per cent glycerine solution made slightly alkaline by adding sodium bicarbonate as follows:-

To 79 cc. glycerine are added 100 cc. distilled water plus 3 grains of sodi bicarb. This is 50 per cent glycerine by weight.

The pulp collected from two or three calves at the end of 120 hours after inoculation with vaccinia virus is mixed so as to give about 70 grammes of pulp. This pulp is then weighed and mixed with sterile alkaline glycerine solution in the proportion of one part by weight of pulp to five parts by weight of 50 per cent glycerine solution (one gramme of pulp by weight is equal to 0.9 cc. of 50 per cent of glycerine and water by volume). Glycerine used is chemically pure and redistilled with a specific gravity of 1260.

The requisite quantity of alkaline glycerine solution is not added all at once but slowly while the pulp is being ground in the Doering lymph grinding machine. Grinding is done in a small glass-covered chamber. The lymph is passed slowly thrice through the Doering machine and then once through the Chalybus grinding machine so as to form a proper emulsion. Then it is tested to see that it is homogeneous and faintly alkaline. The lymph emulsion is then placed in sterile bottles which are corked and at once placed in the ice chest and removed to the cold storage room with a temperature of -10°C. to -12°C.

Lymph prepared in this manner and preserved at the temperature of -10°C. to -12°C. has been found to retain its potency for three or more Glycerine also exerts some bactericidal effect during the long storage and the count is much reduced when lymph thus preserved is tested after storage of six months or more. However, rapid reduction of bacteria by methods such as exposure of glycerinated lymph to the temperature of 15°C. from four days to a week or more as required and addition of clove oil, passing of chloroform vapour addition of brilliant green, 'zephirol', etc., are also used. At this Institute the usual method for rapid reduction of extraneous organisms is to pass chloroform vapour from 30 to 40 minutes followed by blowing in of filtered air for three hours. However, sometimes, it is found that certain lymph numbers persist in showing high counts and require repetition of chloro-form process. Such repetition, no doubt, is detrimental to the potency of vaccine virus. Sulpha drugs were tried with a view to reducing bacterial count to a standard requirement without success. Recently as the supply of penicillin became freely available, experiments were carried out to test its effect both in reducing the extraneous bacterial count as well as in ascertaining its effect on the vaccine virus. These experiments were further confirmed by trials in the field with such penicillin-treated

Materials and methods

Experiment no. 1 .- A lymph number was prepared in the usual manner by grinding, into a fine emulsion, the pulp collected from two calves inoculated 5 days before and mixing it with 50 per cent alkaline glycerine solution in the dilution of 1 in 6. This lymph number was divided into two equal parts after doing the initial bacterial count. One part called 'A' was treated with penicillin (sodium penicillin) in the strength of 100 to 150 units per cc. of lymph. Penicillin solution was prepared by adding sterile distilled water (pH 6.4) so as to prepare a strength of 1 cc. = 10,000 units. The other part called 'B' was treated in the usual manner by passing chloroform vapour to reduce the count. Bacterial count was again done after treatment in case of both 'A' and 'B'. Results of these are given in table I as also the results of anærobic tests. In all 12 numbers were taken dividing these into two equal parts called 'A' and 'B' All 'A' parts were treated with penicillin and by usual chloroform vapour process practised at this Institute. Potency tests of these numbers were then carried out on rabbits by the method of Stevenson's modification of Calmette-Guérin test as follows:-

Dilutions in sterile normal saline were prepared of each lymph number 'A' and 'B' in 1 in 1,000. In some cases higher dilution of 1 in 10,000 was also done. Of these dilutions 0.1 cc. was placed over measured area of 14 square cm. of rabbit's shaved skin (unstretched) which was scarified. About 4 numbers could be tested on one rabbit. Rabbits are specially selected to see that there are no pigmented areas on the skin. They are mostly 6 months old. Each number was placed on two rabbits with a view to avoiding an error from individual refractoriness, as occasionally a rabbit is found to be partially or completely refractory. On the 5th

day of scarification results are seen when usually confluent vesicles develop in case of good potent lymph number in the dilution of 1 in 1,000. Strong lymphs give a confluent take even with 1 in 10,000 dilution. In case of weak numbers the scarified area may only show semi-confluent vesicles or in some weaker cases only few discrete vesicles might be seen which are counted and noted down.

These numbers after passing the usual bacteriological tests, both ærobic and anærobic, were tested each on five children in the field and results were personally seen on the 7th day. These lymph numbers were also issued to the vaccinators in the province from 6 to 12 months after being treated with penicillin to see if penicillin had any deleterious effect on vaccine virus from its prolonged contact with virus during storage. Results are given in table I attached. They indicate that it has no demonstrable deleterious effect on the virus in the dose used for the purpose and can be safely used for purification of lymph in the manner described above.

Two lymph numbers which showed gas production in the anærobic Robertson's cooked meat medium even after chloroforming were treated with penicillin in the strength of 150 units per cc. of lymph. On testing thereafter anærobically for gas-producing organisms there was no gas production and the culture was sterile. This test has been repeated a dozen times with negative result. Thus it would seem that penicillin will also be of value in purifying lymph numbers showing evidence of gas-producing organisms. Penicillin used in all the experiments was a sodium salt of penicillin from three different companies, viz Glaxo Laboratory, May & Baker, and Parke Davis.

Experiment no. 2A.—In this experiment freshly collected vaccine pulp from a calf inoculated 5 days previously was divided into 5 parts—A1, A2, A3, B and C—of 8 grammes each. Part A1 was then separately ground into fine emulsion by addition of 40 cc. (a small quantity at a time) of specially prepared sterile phosphate citric acid-buffer solution with pH of 7.4. Ultimately the whole of the solution was added to it so as to give the resulting dilution of 1 in 6.

Similarly A2, A3 and C were also finely ground and formed into emulsions by slowly adding 40 cc. of sterile phosphate citric acid-buffer solution of 7.4 pH to each of them.

Sample B was triturated and formed into emulsion by adding 36 cc. by volume of faintly alkaline glycerol (prepared by adding 3 grains of sodi bicarb to 79 cc. of glycerine—sp. gr. 1260—and 100 cc. of distilled water). The usual vaccine lymph is prepared in this manner having the dilution of 1 in 6.

The bacterial count was taken of each of the samples and to A1 penicillin in the strength of 100 units per cc. of emulsion was added and the emulsion was thoroughly shaken. Penicillin

TABLE I

#			THE IN	IDIAN I	MEDICA	L GAZE	TIE		ĮOd	T., 1948
-	Results received From Vaccinators	Insertion success rate, per cent	98.14	98.04	99.50	94.31	98.26	96.84	99.81	99.14
		Case success rate, per cent	100:00	100.00	100.00	98.40	100.00	99.85	100.00	100.00
	Total	vac- cinated	1,146	375	1,022	1,093	898	4,092	760	2,829
	Date of	despatch of vaccinators	2, 3, 6, 7, 8 Oct. 1947.	3 to 11 July 1947.	1 Oct. 1947	11, 13, 19 to 23 Aug. 1947.	27 Aug., 1, 3 Sept. 1947.	8, 12, 19 to 27 Aug. 1947.	8, 12 Aug. 1947.	4 to 9, 11, 12 Aug. 1947.
	TENCY RESULTS RABBITS	1 in 10,000 dilu- tion	: .	:	C.W.	C.W.	:	:	S.C. 4	8.C.
	Potency test results of rabbits	1 in 1,000 dilu- tion	C.W.	C.W.	:	:	C.W.	C.W.	C.W.	C.W.
	SSING	M	No gas	No gas "	No gas "	No gas	No gas	No gas "	No gas	No gas
	DATE OF PASSING	RCM	20-3-47 22-3-47	9-4-47 14-4-47	20-3-47 22-3-47 	9-4-47 14-4-47	22-3-47	22-3-47	20-3-47 22-3-47 	28-6-47
	митн ру	broth	No gas Ok	No gas Ok	No gas Ok	No gas Ok	No gas Ok	No gas Ok	No gas Ok	No gas Ok
		Glucose broth	20-3-47 Rabbit 27-3-47	9-4-47 Rabbit 19-4-47	20-3-47 Rabbit 29-3-47	9-4-47 Rabbit 19-4-47	24-5-47 Rabbit 6-6-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	26-4-47 Rabbit 5-5-47
	DETAILS OF BACTERIOLOGICAL TEST		Sterile "	Many colonies 200 per cc. 500 per cc.	Sterile 300 per cc.	Many colonies 200 per cc.	300 per cc. 100 mould 800 per cc.	1,100 per cc. 2,300 per cc.	Many colonies 600 per cc.	Many colonies 5,000 per cc. 200 per cc. 1,000 per cc.
	Details		15-2-47 S 15-3-47 26-3-47	19-3-47 26-3-47 5-4-47	15-2-47 20-3-47	15-3-47	24-5-47 29-5-47 21-6-47	15-3-47	3-4-47	15-3-47 25-3-47 14-4-47 23-4-47
	Date of treating	with penicillin and its dose	10-2-47 100 units per cc. of lymph.	:	10-2-47 100 units per cc. of lymph.		29-3-47 150 units per cc. of lymph.	: :	29-3-47 150 units per ec. of lymuln.	: :
	4	chloro- forming	:	26-2-47 (40 min.). 22-3-47 (15 min.).	•	26-2-47 (40 min.). 22-3-47 (15 min.).	:	24-2-47 (40 min.).	:	24-2-47
		Date of manu- facture	18-9-46	18-9-46	15-1-47	15-1-47	26-10-47	26-10-47	27-11-46	27-11-46
	1	tity rin ec. fi	298	738	210	210	260	260	273	273
	-		4	Ø	- B	B 89	61 A	6861 · B	6939 A	6939 B
		Lymph number	6764	6764	7059	7059	3 6861	<u> </u>	- 5	
		Serial num- ber	-		S		·•	•		

Ocr.,	1948]	EF	FECT	OF PI	ENICII	LLIN C	OAV, MC	CCINE	VIRU	S: PA	TEL		455
99.14	97.22	98.24	100.00	97.41	97.16	97.52	98.92	99.24	98.73	95.33	99.21	19.76	98.65
100.00	99.47	100.00	100.00	99.78	99.39	100.00	100.00	100.00	90.98	100.00	100.00	100.00	100.00
1,070	618-	2,020	160	1,851	244	202	.497	1,011	2,970	982	1,406	131	1,482
26, 28 to 30 April, 5 to 7 May 1947.	30 April, 7, 11, 20, 21 .May 1917.	28 to 30 July, 6,7 Aug. 1947.	11, 12 Aug. 1947.	3 to 6, 8, 9, 11, 18 June 1947.	7, 11, 16, 17 June 1947.	1, 2, 4, 6, 7, 8 to 13, 15 Oct. 1947.	1, 3, 4, 6 Oct. 1917.	19, 20 to 27, 29 Aug. 1947.	12 to 14, 26, 27, 29 Aug. 1917.	5, 6, 7 Jan. 1948.	5, 6, 7 Jan. 1948.	7 April 1918	S.C. 4 S, 9, 10, -17 Dec. 1947.
C.	Ċ.	:	:	S.C. 4	S.C. 1	:	:	:	:	:	:	C.W.	S.C. 3
:	:	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.	C.W.
gas	gas "	gas ,	gng ,	gas	gas "	gas,	gas "	,, ,,	gas "	gus "	gras "	gas "	gas "
No.	No 2	7 No.	No No	No	No 2	No.	No 2	No 7	No.	No Z	No.	No.	7. No.
22-3-47	20-3-47 22-3-47	20-3-47 22-3-47	20-3-47 22-3-47	20-3-47 22-3-47	20-3-47 22-3-47 	20-3-47 22-3-47	20-3-47 22-3-47	30-4-47	30-4-47	30-4-47	9-6-47 5-7-47	30-4-47	5-7-47
o gas	o gas k	gas K	o z Bus	sag o	o gas k	sug o	o gas	su g o	S Gn4	sug c	suz o	5 ga4	sug c
OK OK	ÖK ÖK	ŠŽ ŠŽ	ÖK	ok o	ŠŽ ŠŽ	N O N O	ŠŠ	ŠŠ	SK OK N	N Ok Ok	కిఠ	N N N	ŎĶ.
20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	20-3-47 Rabbit 29-3-47	30-4-47 Rabbit 9-5-47	30-4-47 Rabbit 9-5-47	30-4-47 Rabbit 9-5-47	9-6-47 Rabbit 18-6-47	30-4-47 Rabbit 9-5-47	5-7-47 Rabbit 14-7-47
700 per cc. 700 per cc.	200 per cc. 200 per cc.	3,100 per cc. 2,600 per cc.	400 per cc. 200 per cc.	100 per cc. 900 per cc.	900 per cc. 300 per cc.	4,200 per cc. 2,000 per cc.	900 per cc. 300 per cc.	900.per cc. Sterile	1,800 per cc. 1,500 per cc.	8,000 per cc. 2,800 per cc. 1,500 per cc.	Many colonics Sterile "	200 per cc. Sterile	Many colonies 1,100 per cc. 1,300 per cc.
18-3-47	18-3-47 20-3-47	20-3-47 3-4-47	18-3-47 20-3-47	18-3-47 3-4-47	18-3-47 20-3-47	3-4-47	18-3-47	15-4-47	23-4-47	15-4-47 7-5-47 29-5-47	9-4-47 26-4-47 29-5-47	15-4-47 29-5-47	19-4-47 21-6-47 25-6-47
18-3-47 100 units per cc.		18-3-47 100 units per cc.	:	29-3-47 150 units per ec.	:	29-3-47 150 units per cc.	:	29-3-47 100 units per cc.	:	29-3-47 100 units per cc.	:	29-3-47 150 units . per cc.	
:	15-3-47 (35 min.).	:	15-3-47 (35 min.).	:	15-3-47 (35 min.).	:	15-3-47 (35 min.).	:	19-4-17 (25 min.).	:	27-4-47 (25 min.).	:	17-4-47 (25 min.). 23-5-47
5-10-46	5-10-46	5-10-46	5-10-46	5-10-46	5-10-46	5-10-16	5-10-46	2-10-46	2-10-46	2-10-46	2-10-46	740	
258	259	297 —	298									5-10-46	5-10-46
A 2	- 7	~~~ ~~~~~	ਲ ਜ	A 247	B 2:48	293	203	253	253	272	273	262	262
6818	6818	6819	6819]	6820	6820 E	6821 A	21 B	Z 2	E El	3 A	A E	₹ .	m
.10			<u> </u>				6821	6812	6812	6813	6813	6817	7189
•						∞ ∽		c		10		Ħ	

solution was prepared by adding sterilized distilled water so as to form a strength of 1 cc. = 10,000 units.

To sample A2, 500 units of penicillin per 1 cc. of emulsion were added and the emulsion was shaken as above.

Similarly to sample A3, 5,000 units of penicillin per cc. of emulsion were added.

Sample B containing 50 per cent alkaline glycerine was kept as such.

Sample C was put up as control.

Each of these samples were then divided into two equal parts. One batch of these, called A1 rf, A2 rf, A3 rf, B rf, and C rf, was placed in the refrigerator with a temperature from 0° to 2°C., while the other batch, called A1 rm, A2 rm, A3 rm, B rm, and C rm, was kept at room temperature (22°C.). Colony counts of these were taken and potency tests on a pair of rabbits with each of these batches of samples were carried out after 2 days, 5 days, 10 days, 15 days, 22 days, and 114 days. Potency tests were carried out in some cases in 1 in 1,000 and in some in 1 in 10,000 dilution as in the case of experiment no. 1.

Results are given in a tabular form in table II.

It also indicates that vaccine lymph kept at refrigerator temperature preserves its potency for much longer time than at room temperature. In fact even after three months and 20 days after treatment at the rate of 5,000 units of penicillin per cc. of lymph, when kept in a refrigerator at a temperature of 2°C., it gave confluent take in 1 in 1,000 lymph dilution.

Experiment no. 2B.—On 19th August, 1947, samples A, B and C consisting of freshly collected calf pulp of 2 grammes, 3 grammes, and 4 grammes respectively were taken. To sample A consisting of 2 grammes of pulp 10 cc. of phosphate citric acid-buffer solution of pH 7.4 were added and triturated to a fine emulsion. To this then was added penicillin at the rate of 25,000 units per cc. of lymph.

To sample B consisting of 3 grammes of pulp, 13.5 cc. by volume of 50 per cent alkaline glycerine solution were added and the whole was triturated to a fine emulsion.

To sample C consisting of 2 grammes of pulp which was put up as control, 10 cc. of phosphated citric acid-buffer solution were added and the whole was triturated to a fine emulsion.

All these samples were then divided each into

TABLE II
Experiment no. 2A

Results of potency tests done on rabbits with samples of lymph treated with penicillin on 16th July, 1947, as per experiment no. 2A

				Resu	JS AFT	ER TREATMEN	r with	PENICILLIN A	AFTER		•
	2 0	2 days 5 days] 1	10 days		15 days		22 days	
Kept at 22°C.	Dil	Dilution		Pilution I		Dilution		Dilution		Dilution	
	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000
A1 rm A2 rm A3 rm B rm C rm	 c.w. ∷	C.W. C.W. C.W. C.W.	c.w.	C. 4 area C. 4 " C. 4 " C. 4 "	 c.w. ∷	S.C. ½ area S.C. ½ " S.C. ½ " S.C. ½ " S.C. ½ "	C.W.	S.C. 1 area S.C. 1 " S.C. 1 " S.C. 1 " S.C. 2 "	C. 3	S.C. ‡ area S.C. ‡ " S.C. ‡ " S.C. ‡ " S.C. ‡ "	
Kept at 2°C. A1 rf A2 rf A3 rf B rf C rf	C.W.	C.W. C.W. C.W. C.W.	c.w.	C.W. C.W. C.W. C.W. C.W.	C.W. C.W. C.W.	S.C. ½ area S.C. ½ " S.C. ½ " S.C. ½ " S.C. ¾ "	C.W. C.W. C.W.	S.C. 1 area S.C. 1 " S.C. 1 " S.C. 1 " S.C. 2 "	C.W. C.W. C.W.	S.C. ½ area S.C. ½ " S.C. ½ " S.C. ½ "	C.W. C.W. C.W. C.W.

C.W. = Whole 14 square cm. area showing confluent take.

S.C. = Semi-confluent take.

The results in table II indicate that penicillin even in the doses of 5,000 units per cc. of lymph has no greater deteriorating effect on vaccine virus than that observed with glycerinated lymph.

two equal parts and one batch of these was kept in the refrigerator at 2°C., while the other at the room temperature of 22°C., and the potency tests were carried out on rabbits at different time intervals as given in table III.

TABLE III Experiment no. 2B

Results of potency test done on rabbits with samples of lymph treated with penicillin and glycerine solution on 19th August, 1947, as per experiment no. 2B

		RESULTS AFTER TREATMENT WITH PENICILLIN AFTER										
Kent at	3 d	lays	7 days		15	15 days		81 days				
Kept at 22°C.	Dilu	ition	Dilt	ıtion	Dilution		Dilution					
	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000	1 in 1,000	1 in 10,000				
A rm B rm C rm	Not done	C.W. C.W. C.W.	Not done	S.C. 2 C.W. C.W.	S.C. 1 S.C. 1 S.C. 1	Not done	Not done	Not done				
Kept at 2°C.				•			") ;				
A rf B rf C rf	Not done	C.W. C.W. C.W.	Not done	C.W. C.W. C.W.	C.W. C.W. C.W.	Not done	C.W. C.W. C.W.	Not done				

C.W. = Whole area of 14 square cm. of scarified skin showing confluent take. S.C. = Semi-confluent take over half area.

The results in table III indicate that at room temperature of 22°C., penicillin when used in a large dose of 25,000 units per cc. of lymph exerts some deleterious effect on vaccine virus as compared with glycerinated lymph and the control lymph from the 7th day onward. In the case of samples kept in the refrigerator at 2°C., this was not observed even after 14 days.

Experiment no. 3.—In this experiment 4 rabbits were taken and their skins over the belly were shaved. Two of these rabbits were injected with 3,000 units of penicillin every three hours from morning at 8 a.m. After giving two injections to each of the first two rabbits all the four rabbits were inoculated with vaccine lymph by the method of scarification over the shaved area of the skin. Penicillin injections of 3,000 units were continued every three hours for 5 days in the case of the first two rabbits; while the other two rabbits acted as control. Results of growth of vaccine virus on the inoculated area of the rabbit skin were observed on the 4th, 5th and 6th days in the case of all rabbits. It was observed that there was no difference in the take and all showed a good uniform confluent take.

This result would indicate that penicillin in the dose used has no effect in vivo on the growth of vaccine virus.

Summary and conclusions

1. Penicillin can be safely used for the rapid purification of vaccine lymph and the dose required is usually not more than 150 units per cc. of lymph. In this dose it has not affected the potency of the vaccine virus even when the lymph has been used after, being stored for more

than 6 to 12 months in the cold room at a temperature of -12°C., as judged by results on the children vaccinated by this lymph.

- Treatment with penicillin in a dose of 5,000 units per cc. of lymph was found to have no deleterious effect on vaccine lymph even after preservation in a refrigerator at 2°C. for 4 weeks and more,
- 3. Penicillin used in a large dose of 25,000 units per cc. of lymph exerts some destructive effect on the vaccine virus when kept at room temperature for 7 days or more.

This is not observed in the case of the lymph kept in a refrigerator with 2°C. temperature even after 14 days after penicillin treatment.

I take this opportunity to thank all the staff of the Vaccine Institute in giving their full co-operation in carrying out these experiments at the time when Vaccine Institute was faced with heavy demands, A. V. Konnur, R. M. Manjarekar and M. H. Jamadar in particular. I also thank the Director of Public Health, Major E. Benjamin, for his encouragement and for allowing me to publish this paper.

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FURTHER OBSERVATIONS ON PAREN-TERAL PALUDRINE HYDROCHLORIDE IN MALARIAL FEVERS

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and

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A PRELIMINARY report on 52 cases of malarial fevers treated with parenteral paludrine in a dose of 15 cc. (0.1 gm. per tablet) was published in the Indian Medical Gazette (Basu Mullick and Gupta, 1947). This communication gives the results of the continuation of the trial on a further series of 191 cases in different doses during the latter part of 1947 at the Ludlow Jute Mills, Chengail.

Solution and dosage.—Paludrine was dissolved in normal saline, 1 tablet in 5 cc. (2 per cent). After the binding material had settled down the clear supernatant solution was syphoned off and autoclaved. 20, 30 and 35 cc. (i.e. 4, 6 and 7 tablets) were used per injection.

Season and type of cases.—The period of the trial lasted from July to December 1947. The mills employed 5,859 hands and the daily average attendance at the company's outpatient department was about 150. There were

Classification of 191 patients treated with parenteral paludrine

par occor at parties									
		Ap	ULTS		SCENTS YEARS)				
		Males	Females	Males	Females				
Bengali Madrassi Oriya Upcountry Bilaspuri	•••	122 18 13 8 7	0 9 1 1 1	2 4 0 1 0	0 , 4 , 0 , 0 ,				
		168	12	7	4				

4,817 cases of malarial fevers in all, 1,508 acute or new attacks and 3,309 chronic or relapsing cases. The diagnosis of malaria was entirely on clinical basis. Cases treated parenterally were presumed to be B.T. cases as past experience shows that 95 per cent of all malaria cases in this locality are B.T.

The Bengali labour as a rule live in their village homes while the rest are entirely resident in the company's coolie lines with all sanitary facilities. Bengali females refuse to have injection treatment while Madrassi women always prefer it to oral treatment. Oriya females, except the sweeper class, are conspicuous by their absence in labour lines.

Results of parenteral paludrine treatment

Dosage	Type of cases	Num- ber of cases	Number of patients afebrile in 12 hours	Number of patients afebrile with 2nd dose after 24 hours
20 cc. (4 tablets).	Acute (new). Chronic (relapse).	53 62	41 (77.3%) 40 (66.6%)	12 22
30 cc. (6 tablets). 35 cc. (7 tablets).	Acute (new). Do.	55 21	43 (78.1%) 16 (76.2%)	12 5
		191	140 (74.5%)	51

In the 20 cc. group the first injection suppressed the fever in 77.3 per cent of first attacks and 66.6 per cent of chronic cases. A second dose of 4 tablets suppressed the fever in all the remaining cases of both types (8 tablets in 48 hours).

In the 35 cc. group all cases were acute attacks. The suppression rate was 78.1 per cent after the first injection in 12 hours. A second dose of 15 cc. (3 tablets) rendered the remaining cases afebrile in 48 hours (9 tablets in 48 hours).

In the 30 cc. group all cases were acute attacks. The first injection suppressed the fever in 76.2 per cent in 12 hours and a second one of 15 cc. in the remaining cases in 48 hours (10 tablets in 48 hours).

It would thus appear that in the above series there was no proportional increase in the suppression rate of fever by increasing the dosage of parenteral paludrine above 20 cc. This amount (20 cc. of the 2 per cent solution) has since been made the standard optimal dose.

Absence of toxicity, a marked feature.-The remarkable feature in all these cases was the entire absence of any toxic symptoms from paludrine. Intravenous injections were usually given when the fever was very high and often when the patient was actually in the grip of the

ague. There was never any sign of toxic symptoms even of minor nature in male or female patients.

Completion of the course.—After the patients had become afebrile they were given oral tablets to complete a dose of 21 tablets in all. In many cases 3 tablets were given by mouth every morning and in some cases paludrine solution (1 tablet in oz. flavoured with menth. pip.) was given thrice daily.

Relapses and their treatment.—Relapses from all the 4,817 cases are tabulated below:—

cases 7 to 14 days (usually 10 days) after the injection of an antiserum (in India usually antitetanus serum and antivenene; in the West antidiphtheria and anti-tetanus sera). It is characterized by fever, urticaria, pains in joints (fluid may be present), enlargement of glands and oddema of the face (occasionally the larynx is also involved). Its probable immunological basis is the presence of the antigen (the foreign protein of the injected serum) and the antibody (formed by the system of the injected subject) in the system at the same time, resulting in a precipitin reaction in the tissues.

RELAPSES WITHIN

	Туре	`	Total	15 days	30 days	Total	
Acute	••	••	1,508	135 (8.95%)	306 (20.29%)	441 . (29.24%)	
Chronic	••	••	3,309	314 (9.49%)	411 (12.42%)	725 (21.41%)	Mean 25.32%

For checking the relapses at first 2 tablets were given at spaced interval of 3 days but this soon proved ineffective. After the fever was completely suppressed with a full course of 21 tablets, 3 tablets a week for 4 weeks and afterwards 2 tablets a week at spaced interval were necessary.

Summary

- 1. Paludrine, 2 per cent solution in normal saline, has been used intravenously in 191 acute, and chronic cases of malarial fever in doses varying from 4 to 7 tablets (0.1 gm. per tablet) with a mean suppression rate of fever of 74.5 per cent in 12 hours after the injection.
- 2. Absence of any toxic symptom whatsoever in all types of cases was a marked feature in this series.
- 3. There is no proportional increase in the suppression rate of fever by increasing the single intravenous dose of 20 cc. in 12 hours.
- 4. The mean relapse rate in this series of 4,817 cases was 25.32 per cent.

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SEROLOGICAL TECHNIQUE (contd.)

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SERUM SICKNESS: TYPES, BASES, TREATMENT AND PREVENTION

The Usual Delayed Serum Sickness

This constitutional upset, consequent on the injection of a foreign protein, occurs in many

A local reaction, after a second injection in the course of the disease or immunization, also occurs. It varies from ædema to sloughing. The second injection, therefore, should not be given near the site of the first injection.

Neuritis of various forms and degrees also occurs.

A meningeal reaction also occurs and it was important to recognize it when cerebrospinal fever was treated by anti-meningococcal serum.

The incidence of serum sickness has decreased with the introduction of concentrated and refined sera—with the crude unconcentrated sera it is 50 per cent, with the concentrated sera it is 10 to 25 per cent and with the refined sera it is less than 5 per cent.

The treatment is symptomatic as well as specific: calamine lotion or a strong menthol ointment (menthol 1 drachm, soft white paraffin 1 ounce) locally, if irritation be present; antipyretics or aspirin by mouth; anti-histamine substance by mouth or subcutaneously; atropine, adrenalin or ephedrine subcutaneously. Ephedrine hydrochloride can also be given by mouth (for details see under *Immediate Reaction*).

Immediate Reaction

This serious reaction of hypersensitiveness to foreign protein is like anaphylaxis and may in fact be anaphylaxis itself depending on a naturally occurring antibody in the system. Occurring as it does on the first contact it differs from what is usually described as anaphylaxis, a reaction occurring on the second contact.

[Briefly anaphylaxis, as studied in a guineapig injected with horse serum, occurs thus: (1) First parenteral dose of the horse blood protein given sensitizes the animal in 10 days. This dose is called the Sensitizing Dose. It really produces in the animal's system an antibody. (2) Second dose of the same serum given after 10 days shocks and kills the animal. This is called the Assaulting Dose.

The mechanism of the shock is the following chain of events: (1) The antibody formed in the system of the animal reacts with the antigen (the horse blood protein), and an intra-cellular precipitate is formed. (2) The precipitate injures the cells and a histamine-like substance is liberated. (3) The histamine-like substance acts on the histamine-sensitive tissue which in the case of the guinea-pig is located in the respiratory system. The animal sneezes, rubs its nose on the floor, cannot breathe, jumps, is convulsed and drops down dead.

The mode of death in the rabbit and the dog is different. The dog often recovers. The monkey is refractory. Perhaps man is never fatally shocked in true anaphylaxis.

The antibody formed is both free in the blood and fixed in the tissue cells. The intra-cellular injury, due to intra-cellular precipitate, only results when the fixed antibody is more than the free antibody.

The liberation of the histamine-like substance is brought about under the influence of the parasympathetic system which can be controlled by the sympathetic system: Hence the arrest of the chain of event by adrenalin.

Anaphylaxis probably has not been developed in the course of evolution and thus does not confer any benefit on the animal subject to it. Immunity and antibodies subserving it are distinctly beneficial and have probably been developed in the course of evolution, by natural selection. In the struggle for existence the animals developing antibodies and the consequent immunity survived while those not developing these substances and the protection conferred by them perished. Infection and sub-clinical infective states occur in nature. Nothing comparable to the parenteral entry of foreign proteins, however, occurs in nature.

Dramatic episodes occur in anaphylaxis and serum sickness only. Other reactions due to sensitization with the proteins of bacterial bodies, proteins taken with food, proteins inhaled and proteins absorbed through skin are covered by the term allergy. The whole subject is covered by the term hypersensitiveness. These proteins are the antigens. They produce in the system the antibody with which they later react.

Not all antigens are proteins: some are nonprotein fractions of a large protein molecule.]

It is a serious occurrence and may be fatal in a few minutes or after a few hours. All subjects suspected of being hypersensitive (vide infra) should be watched for several hours if they must be injected with an antiserum. Intravenous route should not be used. Even intramuscular route should be used after a small

dose of the serum given subcutaneously has been tolerated.

Treatment.—Adrenalin hydrochloride, 1 in 1,000, should be kept ready in a syringe, not in an ampoule, and given as soon as restlessness in the patient is perceived. The secret of success with adrenalin lies in: (1) Giving it as early as possible. As soon as signs or symptoms appear give 2 to 5 min. (2) Repeating it as long as required in the same dose at the end of ½, 1, 2, 4 and 8 hours. The needle may be left in position in the thigh, under a sterile dressing kept in position in its turn by adhesive plaster.

In desperate cases intracardial injection must be considered.

A ½ gr. tablet of ephedrine hydrochloride may also be given by mouth at the time of the first injection and repeated 6-hourly for 24 hours.

On cases that cannot tolerate ephedrine, ephetonin (an isomer of ephedrine, Merck, same dose) or pseudo-ephedrine (Burroughs Wellcome & Co., 1 gr. dose) may be tried, or a sedative may be added (luminal, amytal, etc.).

The serum in all suspected cases should be given subcutaneously, in the forearm or in the leg, well below the knee, and a tourniquet kept ready for application by an assistant, if untoward symptoms appear. The tourniquet is relaxed later when the symptoms have been overcome by adrenalin.

Repeated doses of adrenalin may be necessary when the patient is being watched.

Thermal Reaction

A rigor and rapid rise of temperature occur. The reaction is probably due to 'pyrogens'.

Treatment.—Hot water bottles and later plenty of fluids to drink will suffice. Adrenalin may also be given, if indicated, by weak pulse.

Conditions Arousing Suspicion of Hypersensitiveness to Serum

The following should be suspected: (1) Allergic persons, subject to frequent rhinitis, urticaria, eczema, and food intolerance. (2) Asthmatic persons. (3) Persons inordinately intolerant of domestic animals, particularly the horse. (4) Persons showing eosinophilia—blood film will be necessary for differential count. (5) Persons with family histories of the foregoing conditions. As stated before, intravenous and even intramuscular injections of serum should be withheld in the case of such patients.

The foregoing classes of patients are likely to react on the first contact. Patients who have received serum on a previous occasion are also to be suspected, tested for hypersensitiveness and given serum with caution (vide infra). The reaction in them would be the usually described anaphylaxis occurring on the second contact. Such reactions are however rare and fatal anaphylaxis of this variety probably never occurs

in man. The immediate reaction of the first contact, however, is not rare and kills many patients, specially children.

Testing for Hypersensitiveness

A 1 in 10 dilution of the normal serum of the animal in which the antiserum has been produced is required for testing. If the normal serum is not available the antiserum to be injected may be used.

The normal serum is to be preferred for 2 reasons: (1) The antiserum may yield an E.E. (Erythematous-edematous reaction of Foshay) reaction which will look like a positive reaction. The basis of this reaction is again the reaction between the antigen and the antibody: the antigen, causing the disease, in the patient and the antibody in the antiserum used in the test. In the prophylactic treatment of tetanus and in cases of snake bite, however, the antigen is not present everywhere in the body at this stage; the antiserum can, therefore, be used safely in the place of the normal serum. (2) The protein in the concentrated (specially the refined) serum may be reduced below the quantity necessary for a superficial test and yet may react when introduced into the circulation.

Eye test.—Instil a drop of a 1 in 10 dilution of the serum into one conjunctival sac. Observe for 10 minutes. There should be no congestion. The congestion indicates a positive reaction and a state of hypersensitiveness in the patient.

Skin tests.—(1) Inject intradermally 0.02 cc. of the same dilution. Read result in 10 minutes. There should be no wheal. A wheal indicates a positive reaction and a state of hypersensitive-(2) Rub one drop of the same dilution on a superficial scratch $\frac{1}{3}$ inch long. Read result in 15 minutes. There should be no edematous swelling. A swelling indicates a positive reaction and hypersensitiveness. Both these reactions are undertaken when the eye test is negative.

Trial dose.—Give a small dose, e.g. 0.1 to 0.5 cc. of a 1 in 10 dilution of the serum by the same route which has been chosen for the whole dose. If no disturbing symptoms appear within half an hour give the total dose slowly (watching the piston of the syringe passing every mark slowly, as in measuring quantities).

In civil practice every case should be so

If a positive reaction occurs or disturbing symptoms appear, (1) give small doses mixed with adrenalin or (2) use continuous intravenous

For the small dose system the following has been recommended:

- 1. Inject 0.05 cc. with 0.3 cc. of adrenalin chloride, 1 in 1,000, subcutaneously.
- 2. Repeat injections at half-hourly intervals, keeping adrenalin constant but increasing serum

to 0.1 cc., 0.2 cc., 0.5 cc., 1 cc., 2 cc., until the total quantity has been given.

In the continuous drip system the serum is diluted 1 in 10 in saline or 5 per cent dextrose in saline and given in the usual manner not exceeding 60 drops per minute: Adrenalin should be ready in a syringe and injected into the rubber tube of the apparatus, near the needle, if necessary. The drip system has given complete satisfaction in experiments on animals, in an anaphylactic period.

Sera of bovine origin are also available and may be used when previously a horse serum has been used and an anaphylaxis is feared. The tests will then be undertaken with the bovine serum.

FOOD AND DRUG INTOLERANCE

After the serum sickness may be considered briefly food and drug intolerance, and sensitization in industry.

Food Intolerance

It may be possible to immunize against food which is not tolerated. Sterile saline extracts of the food in increasing doses can be given after a skin test (see AUTO-URINARY PROTEOSE THERAPY). A 1 in 1,000 extract (1 part food in 999 parts saline) is a convenient preparation.

The immunological basis of the intolerance is the naturally occurring immune body usually known as atopen.

Treatment.—As for serum sickness.

Food allergy may appear, disappear and reappear.—The following cases illustrate such occurrences :---

Dr. K. V. K. comes from an orthodox Brahmin family of Southern India. ancestors never consumed any animal diet other than milk and butter. In 1926 at the age of 30, he went abroad for post-graduate studies and ate animal diet for several years without any trouble. On his return he reverted to vegetarian diet, Madrassi type, but found that it produced flatulence and diarrhœa. He adopted animal diet. All went. well for a few years. Then he began to have mixed diet, Madrassi vegetarian lunch and nonvegetarian dinner. Then skin rashes accompanied by itching began to appear and caused much trouble. He took indigenous treatment for desensitization. Common salt was excluded completely and so were many other items, and a herbal preparation (Mahathikthakam ghee) was taken. By trial and error a suitable vegetarian diet was found. Goat's milk was also added. It was tolerated. For some years there was no attack. Again when he took mixed vegetarian and meat diet the trouble started.

He adopted the animal diet again and all was well for over three years. Now he finds that the rash reappears whenever he resorts to his old orthodox diet.

phalanx. The pain in the affected digit was throbbing in nature and was worse at night.

About seven days ago, he developed similar throbbing pain in the right second and third toes. This was followed by an ulcer involving the upper end medial edge of the nail of the right third toe and the adjacent skin.

On examination the patient was an average Bengali male rather pale looking. There was extensive pyorrhœa alveolaris.

The anterior part of both the feet was darker in colour and the skin appeared thickened and coarse. Both feet but specially the left appeared cooler compared to the general surface temperature. The ulcers previously described were seen. On the left third toe the nail had fallen off and the terminal digit was short and truncated. Both toes were acutely tender.

Pulsation.—No pulsation was felt in either dorsalis pedis or posterior tibial but was present in both popliteals.

Buerger's test.—On elevation of each leg pallor was not marked but definite lowering of temperature was noticed. On depression the feet became warmer and slightly cyanotic.

A plain skiagram of both legs did not reveal any calcification in the arterial walls. As the patient was in constant pain, the effect of nerve blocking was tried on two occasions. About 7 cc. of 1 per cent novocaine were injected into the lateral popliteal nerve where it winds round the neck of the fibula. There was immediate relief which lasted for about 2 hours but on reappearance the pain appeared to the patient to be greater in intensity.

To determine the state of the main blood vessels and the collateral circulation, an arteriogram was done on the left side. 'Diodrast' being not available 'Pyelectan' (the dye used for intravenous pyelography) was used (figure 1, plate XXIX). As will be seen no actual block can be seen and the collateral circulation seems fair.

The intensity of the pain and the commencing gangrene justified radical intervention and lumbar sympathectomy was decided upon. This was done under spinal anæsthesia (Percaine 1/1,500). Spinal anæsthesia caused a slight rise of temperature of both inferior extremities but owing to absence of a skin thermometer no actual measurement could be made. The patient was on his back and the two sides were done at the same time using the incision recommended by Jefferson (Turner, 1943) (figure 3, plate XXX). The incision extends from the tip of the 12th rib to the midpoint between the umbilicus and pubis and gives excellent exposure. It does not necessitate turning of the patient. The 2nd, 3rd and 4th sympathetic ganglia and the chain were removed on each side. The wounds were closed without drainage and healed by first intention.

On the day following the operation there was a slight distension of the abdomen which lasted for 48 hours and was relieved by enema.

The surface temperature of both inferior extremities and of the lower abdomen below the level of the umbilicus was definitely up and the difference was appreciable. There was no sweating in this area. After injection of pilocarpine nitrate 1/50 gr. followed by aspirin 5 gr. by mouth and then covering the patient with warm blankets the upper part of the body sweated profusely but the part below the umbilicus did not.

The pain in the feet was by now much less and a fortnight later there was no pain at all. The intractable ulcers showed rapid signs of healing and in three weeks had healed (figure 4, plate XXX). The discoloration of the skin of the feet was also much better and the patient was fit for discharge. He was now walking about without pain.

Another follow-up arteriogram of the left leg was done 4 weeks after operation (figure 2, plate XXX). The difference in the collateral circulation as can be seen is not marked but there seems to be some increase in the number of small vessels.

The patient was discharged free from pain about a month after the operation.

During the last 7 months which have elapsed since the discharge of the patient, he has reported several times periodically. He is free from pain, has gone back to his work and is walking about without difficulty.

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M.T. MALARIA SIMULATING ACUTE ABDOMEN

By T. M. RAO, K.I.H., M.B., B.S.
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A 20-YEAR-OLD male was admitted at 9 a.m. on 8th March, 1948, for the treatment of injuries sustained during a fall from a tree 12 feet high on the previous evening. He stated that he had been unconscious for 2 hours after the fall.

O/E shock absent; pulse 80, respiration 24, temperature 98, simple fracture left femur and Colle's fracture left forearm; c/o pain over right hypochondrium. No fractured ribs found. Heart and lungs n.a.d. Abdomen soft and slightly tender over right hypochondrium on pressure; ½ gr. morphia with atropine was given statim, to be repeated at 2 p.m., for reduction of fractures at 3 p.m.



PLATE XXIV
LIPOMAS. BIG AND SMALL: M. G. KINI. (O. A.) PAGE 447.



Fig. 4.

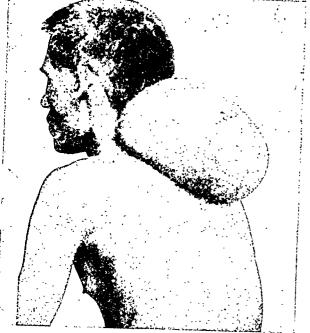


Fig. 6.



Fig. 8.

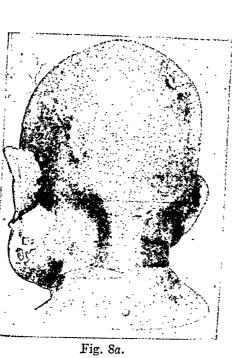




Fig. 5.



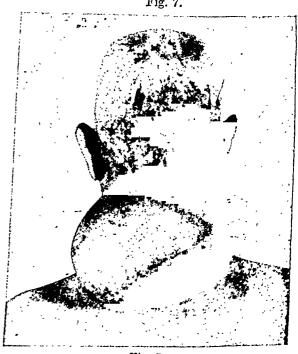


Fig. 7a.

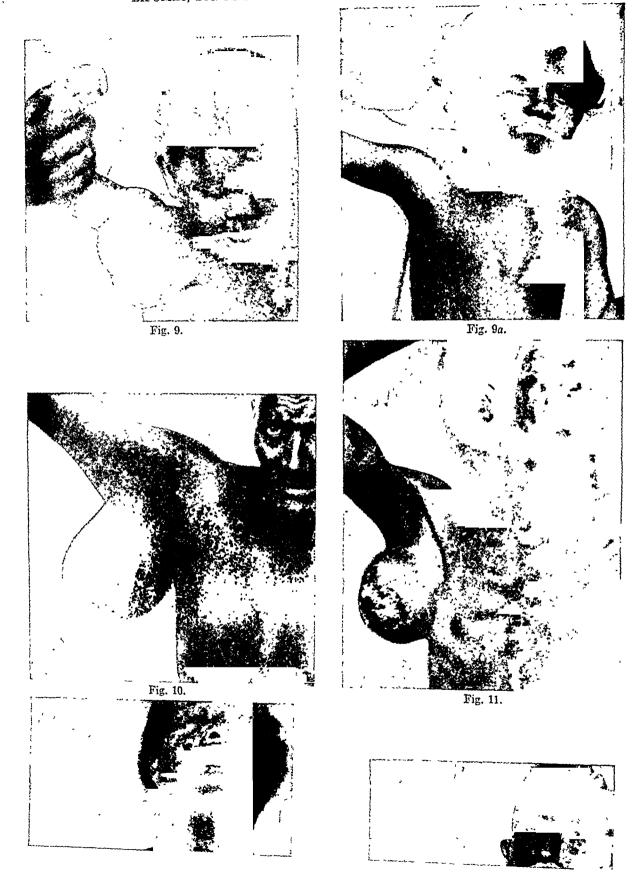


PLATE XXVI LIPOMAS, BIG AND SMALL : M. G. KINI. (O. A.) PAGE 447.



Fig. 13.

Fig 14.

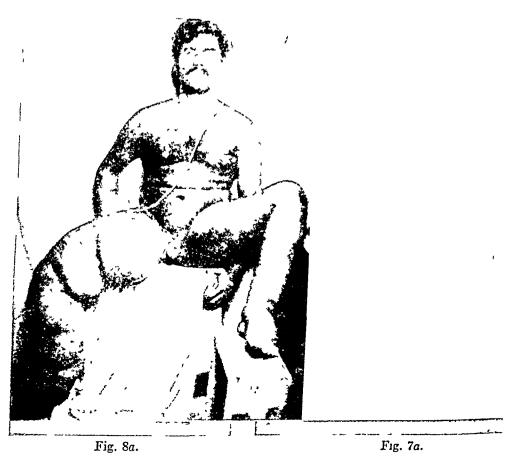


Fig. 8.

Fig. 8a.

 $\begin{array}{c} P_{\text{LATE}} \; XXVII \\ \text{LIPOMAS, BIC AND SMALL} \; : \; M. \; G. \; KINI. \; \text{(O. A.)} \; \; \text{PAGE 447.} \end{array}$



PLATE XXVIII
LIPOMAS, BIG AND SMALL: M. G. KINI. (O. A.) PAGE 447.



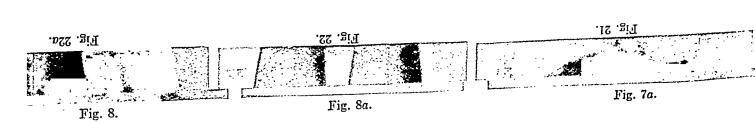


PLATE XXIX THROMBO-ANGIITIS OBLITERANS TREATED BY BILATERAL LUMBAR SYMPATHECTOMY : A K BASU (M H P) PAGE 463



Fig 1.—Skiegram showing arteriogram before sympathectomy.

PLATE XXX THROMBO-ANGIITIS OBLITERANS TREATED BY BILATERAL LUMBAR SYMPATHECTOMY: A. K. BASU. (M. H. P.) PAGE 463



Fig. 2.—Skiagram showing arteriogram after sympathectomy.

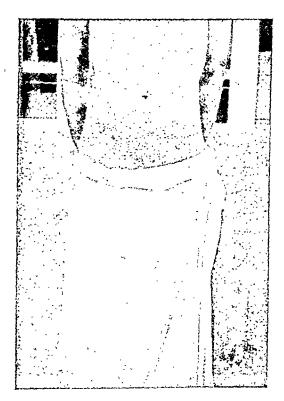


Fig. 3.—Photograph showing incisions.



Fig. 4.—Photograph showing left foot. Healed scar on third toe.

I next saw him at 3 p.m. His face was bathed in sweat and registered distress. The pulse was a query, the respiration 42, temperature 99.4. Said he had passed neither motion nor flatus; had vomited 4 times; c/o thirst; pallor not visible; B.P. 105/35; abdomen fully distended, tympanitic but slightly dull on flanks, so it appeared; liver dullness intact, tender over right hypochondrium, intestinal sounds absent. Urine clear; flatus tube no result. The chart at 2 p.m. was temperature 101, pulse 124, respiration 28, but an overworked nurse had not noticed his condition.

Ruptured liver or perforation first occurred to the mind. The former was excluded by absence of pallor and absence of shifting dullness. The 'prophylactic' dose of morphia given did not warrant me to serious consideration of 'traumatic bruising intestines with delayed shock' as more marks of injury to the abdominal wall were missing. A provisional diagnosis of perforation was made but the possibility of hæmorrhage was not lost sight of. An early exploration was planned. Plasma infusion was started as blood donors were not available.

At 6 p.m. the pulse 148, temperature 102, respiration 38. An enema and flatus tube were tried without success. Condition was unchanged at 8 p.m.; the abdominal condition was as at 3 p.m. M.T. malaria was at this stage considered and blood slides taken. Any idea of operation was for obvious reasons given up and the night passed off uneventfully.

8 to 10 parasites were found per field next day. Injections of quinine, and mepacrine by mouth, were given. Pituitrin, followed by enema, was given at 2 and 4 p.m. With the second, a copious amount of fæces and flatus were passed and the patient became comfortable at once. Reduction of fractures was effected on the 4th day.

In view of the history and the signs, a diagnosis of acute abdomen was natural. Only his condition stayed the knife. His further progress established the diagnosis. Tachycardia was absent during his stay in the hospital and I am unable to account for the rapid pulse. It seems reasonable that the morphia brought about the distension and confused the picture not infrequently presented by M.T. malaria in tropics in simulating acute abdomen.

In endemic areas it is a safety precaution to exclude malaria in acute abdominal cases presenting a confused picture with slight doubts and to resort to a 'wait and watch' policy for an hour or two.

IThe reader can easily guess that: (i) O/E=On Examination, and (ii) c/o=complaints of. We do not disapprove of the abbreviations although they are not given in standard dictionaries. Nor do we disapprove n.a.d. instead of the usual N.A.D.; even nad should do.

Why was the night allowed to 'pass off' for the microscopy?—EDITOR, I.M.G.]

Therapeutic Notes

NOTES ON SOME REMEDIES

XXIV.-BLOOD TRANSFUSION, Part III

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Transfusion in special cases (contd.)

- Medical shock.—Shock may develop in the absence of injury from a variety of causes such as diabetic coma, acute gastro-enteritis or an overwhelming infection from malignant malaria parasites. The symptoms are practically the same as in original shock but are modified by the nature of the particular disease. Transfusion is indicated in those cases where toxemia and dehydration play an important part in bringing about the circulatory collapse and where these features are not influenced by the usual treatment. Plasma or serum is preferable, as the underlying cause is usually in hæmoconcentration with reduction circulatory blood volume.
- 4. Chronic anamia.—The object of transfusion is to restore the hæmoglobin value and thereby raise the oxygen-carrying power of the blood. It may tide the patient over a crisis as in severe macrocytic anæmia when response to liver treatment is poor or in the case of a severely anæmic pregnant woman at term. Fresh blood is best, and to avoid any reaction, it is desirable to use a donor of the same group. Continuous drip technique is adopted to avoid strain on the weakened cardiac muscle and to allow the circulation time to adjust itself to the increased volume. The volume to be transfused is determined on the assumption that a pint of blood will raise the hæmoglobin value by 10 per cent. Marriott and Kekwick (1940) recommended that the hæmoglobin should be raised to 45 per cent when it is initially below 25 per cent; it should be raised to 80 per cent if an emergency operation is required; in aplastic anæmia the aim should be to restore it to 80 per cent and in anæmia of sepsis to 100 per cent. Infants usually require 20 cc. whole blood per kg. of body weight. The rate of administration should never exceed 1 cc. per pound of body weight per hour and this should be reduced to 0.5 cc. if the initial hæmoglobin is below 25 per cent or if there is cachexia or cardiac or respiratory disease.

Red cell suspensions are a satisfactory substitute for whole blood and are specially suitable for cases of aplastic anæmia who have to be transfused at regular intervals. Watson (1943)

recommends a method of calculating the dosage as in the following example:—

Initial hæmoglobin: 5 gm. per 100 ml. Body weight: 55 kg. Desired hæmoglobin after transfusion: 15 gm./100 ml. Hb concentration of red cell suspension: 20 gm./100 ml.

Then blood volume is approximately 55/11 = 5 litres.

Total Hb in body before transfusion is $5,000 \times 5/100 = 250$ gm.

Total Hb in body after transfusion is $5,000 \times 15/100 = 750$ gm.

Therefore the amount of Hb to be added is:—
750 — 250 = 500 gm.

500 gm. Hb is contained in 2,500 ml. of the suspension.

5. Hypoproteinamia.—War and famine have focused attention on this condition which is due to an inadequate protein intake or absorption (e.g. in chronic diarrhea), defective synthesis (e.g. in diseases of liver) or excessive loss of protein (e.g. in acute fevers or after injury). Loss of weight is an important sign. Other suggestive signs are tendency to tire easily, general malaise, abdominal distension and low urinary output. In course of time ædema appears when weight will show increase instead of loss. These changes are reflected in the blood by a fall of plasma protein, but such fall is more common in deficiency of long standing. It should be noted that it is not sufficient to estimate the total protein content only as in hypoproteinæmia only the albumin fraction tends to fall and the globulin fraction may even rise so that the total protein level may be within normal range.

An individual with hypoproteinæmia is liable to get infection easily, his recovery from any illness is impeded and he is a very bad operation risk. The administration of plasma or serum is an efficient method of supplying protein for nutritive purposes when this cannot be supplied at all or in adequate amounts by mouth. It increases the blood volume and protein part of which goes to the restoration of tissue protein and reduces the nutritional ædema. It is valuable in pre- and post-operative work; it helps in building up nutrition in patients with chronic hypoproteinæmia and making them fit Likewise, it is usefor surgical treatment. ful after operation if it is temporarily necessary to stop oral feeding. A series of transfusions is required. Protein hydrolysates are also used for the same purpose but plasma has some advantage in that it allows more protein to be given with relatively little fluid; too much fluid increases the ædema. There is also less reaction. But plasma is becoming a rare commodity in peace time.

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Occasional Notes

TREATMENT OF PARALYTIC ILEUS

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THE treatment of paralytic ileus has presented and still presents extreme difficulties. surgeon has to cope successfully with the cause as well as treatment of the inactive bowel. The simultaneous treatment of these two has troubled the surgeons for ages. There are still differences of opinion as regards the management of such cases (Mukerji, 1945, 1947a). A group of surgeons tries to activate the lazy bowel by cathartics, drugs which will act on the musculature of the gut or its neuromuscular junction or parasympathetic nerves and help the peristalsis to return. Those who support Robb's (1932) views of paralytic ileus have advocated spinal anæsthesia or splanchnic anæsthesia if possible. The other group of surgeons does not rely on this conservative line of treatment and has advocated operative drainage of the distended gut, viz enterostomy. In their opinion the distension of the gut when relieved will help in the return of the tone of the gut musculature. Prominent amongst the latter group are Krogius, Heidenhain, Melchior, Hofmeister and Kanusch. Unfortunately, the operative drainage of the distended coils of the paralysed gut has been It has been successful in a few cases only. found that the catheter drainage can relieve only a segment of the distended coil. So Heidenhain and others, the strong supporters of this group, have recommended the employment of multiple enterostomies. But the very conception as to the genesis of paralytic ileus leads one to conclude that such measures for relief of the gut can be rarely beneficial when the gut is atonic.

The conservative school has employed hot stupes to the abdomen, atropin, pituitary extract, pilocarpine, physostigmine, and choline, etc., in the treatment of the distension in the The principle underlying this therapy is to stimulate the gut and to help in the evacuation of the contents of the bowel. But when the gut musculature is paralysed and its efficient propulsive activity has been disorganized, such effects as expected in the conservative line can Clinically also the successful. results have been disappointing. If the drugs are administered before the gut has entered into the paralytic state and the circulation in the splanchnic bed is active and normal, one would expect to see the beneficial results of the stimulant drugs. So the most valuable agent in the relief of the distension of the gut has been and

is still the suction applied to an indwelling gastric or duodenal tube or Miller-Abbot tube.

The other principles of treatment in such cases are common to both groups of surgeons, viz:

- To maintain the fluid balance. 1.
- To keep the patient at rest both physically and mentally.
- 1. Since the work of Coller and Maddock, the normal quota of fluids necessary to maintain fluid balance in man has been ascertained as 3.6 to 4 pints daily. But the trouble, here, lies in the fact that additional 6 to 7 litres of body fluids are being lost in the gut lumen by the digestive secretions and a quantity is also being lost as exudate or transudate in the gut wall, peritoneal cavity, etc. So the total quantity required in these cases will be-

Normal requirement + X pints where X pints = pints of fluid removed by suction, gastric or duodenal.

Atkins (1942) of Guy's Hospitals advises administration of 8 pints of fluid to such cases in 24 hours by intravenous drip method. In 8 pints of normal saline, there are nearly 75 gm. of salts. But the basic need is 1 to 2 gm. a day. So a much heated and acrimonious controversy has started whether such a large amount of salts should be administered to the patients or not. The main objection is that hyperchloræmia is likely to ensue this administration and it will cause hydræmic plethora. So Atkins has advised that 8 pints of fluid should be as 4 pints of 5 per cent glucose and 4 pints of normal saline. On the other hand Jones and Morgan advise to administer normal quota, i.e. 4 pints of fluid as (N) saline and the rest as 0.18 per cent sodium chloride solution per rectum. Proctoclysis has been found to start reverse peristalsis, so much transfusion of huge amount of fluids per rectum is not advisable. The next trouble lies with the question of selecting a proper solution, i.e. proper electrolytes necessary in such cases. Scudder (1941) and his supporters advo-cate sodium chloride. Falconer et al. (1939) advise Ringer's solution. Ringer's solution contains K and Ca ions in addition to sodium chloride. K and Ca have been found to be of much value in maintaining the tone of muscles. But it has also been proved by the present author (Mukerji, 1944, 1946, 1947d) that K in high concentration in alkalotic blood damages the muscle. So Ringer's solution can be administered without any untoward results at the beginning of the disease, i.e. when the gut is in the paretic stage and blood K is not high. But in subsequent stages when K content is high administration of Ringer's solution is unjustifiable.

Recently Hartmann's solution and hypertonic solutions as 25 per cent saline, etc., have been advocated as their administration helps in the return of peristalsis. Hartmann's solution is

nothing but lactate Ringer's solution. have been found to act directly on the gut muscle. It has been written of hypertonic saline that 'not only does it stimulate peristalsis, but it also replaces the chlorides of the depleted plasma and combats the alkalosis which is often present'. This shows that the present ideas in the administration of fluids and electrolytes are being based on the management of alkalosis in such cases.

Oschner and Gage (Maingot, 1936) have shown that hypertonic Ringer's solution stimulates peristalsis more than does hypertonic saline and that hypertonic Hartmann's solution gives the best results of all. But the danger in using the hypertonic solutions lies in the subsequent lowering of blood pressure. This is also the main reason why spinal and splanchnic anæsthesia are fraught with danger.

Serum transfusion has been advocated as a routine line of treatment as paralytic ileus has been found to result from edema of gut wall which is due to hypoproteinæmia (Leigh, 1942). But the author (Mukerji, 1947b) has shown that hypoproteinæmia is a secondary phenomenon only. Moreover if the results of serum transfusion are studied from the following table, it will be evident that the results of treatment with serum infusion has not improved the outlook at

Cases of acute abdomen (as studied in Medical College Hospital, Calcutta)

Conege Hospital, Calculta)								
	Total number of cases admitted	Number of deaths	Percentage of deaths					
Before	c serum treatm	ent came int	o vogue					
1934	383	152	. 39.8					
1935	334	• 121	37.5					
1936	334	139	38.0					
1937	379	127	37.0					
1938	471	152	32.0					
1939	384	132	35.0					
1940	374	132	35.0					
1941	369	137	35.0					
	Serum transf	l lusion started						
1942	206	74	36.0					
1943	165	72	44.0					
1944	189	82	43.0					
1945	218	101	46.0					
1946	Figures are dis	ا storted due t	o riot-chees of					
	HIVETED TIMES A	ta al						

diverse types and so are not given.

Morphia and its derivatives have been and are still the sheet-anchor in the treatment of paralytic ileus. These drugs not only keep the patient quiet but also maintain the tone of the gut.

Cathartics and enemata need no stress as their results have been proved already as valueless. Alvarez has shown that catharsis is rather followed by a refractory period during which peristalsis is inhibited.

Thus analysing the different methods of up-todate treatment of paralytic ileus one is led to conclude that the main principles are the same always but the divergence lies in the lines followed. But the ultimate aim is to combat the anhydræmia and alkalosis. Unfortunately, the treatment is therapeutic, i.e. when paralytic condition has set in and well advanced. But that by a simple estimation of pH of the blood as the present author (Mukerji, 1947c) has already shown, one can tell as to whether paralytic ileus is likely to ensue or not. He has also shown that paretic gut can be made to contract if blood condition is improved. So the treatment of paralytic ileus has been framed by the present author under two headings:

- 1. Paretic stage when pH of blood shows a tendency to alkalosis (between 7.4 to 7.65).
- Paralytic stage when pH of blood shows a markedly alkaline blood (above 7.65).

Cases in the paretic stage are usually cases of acute abdomen before or just after operation, so the treatment will be discussed under two groups: (I) Preoperative, and (II) Postoperative.

(I) Preoperative treatment

- 1. Administration of fluids (the quantity to be judged by the specific gravity of blood). Fluid is normal saline or Ringer's solution.
- 2. If abdomen is found distended, intestinal decompression is instituted.
- 3. If pH of the blood denotes a markedly alkaline condition of blood, serum should be infused to combat hypoproteinæmia associated with this alkalosis.

By this time the patient is prepared locally and handed over to the surgeon for operation. The operation should be done either with gas and oxygen anæsthesia or local anæsthesia. If ether is used as an anæsthetic, it should be given along with oxygen. Spinal anæsthesia has been held responsible for acute dilatation of stomach. So it should not be a method of choice in such cases.

(II) Postoperative treatment

1. As outlined before, more than normal quota of fluid is necessary now. Ringer's solution cannot be administered. Hypertonic solutions are dangerous. So the best plan is to administer

the normal quota in the form of normal saline by intravenous drip method and the extra amount either by the method as advised by Atkins or in subcutaneous route.

- 2. Radiant heat or infra rays on abdomen for half an hour twice daily.
- 3. Oxygen administration has been experimentally proved to have a marked effect on intestinal distension and on intestinal movements (Schnedorf and Orr). But the methods used to administer oxygen in such cases are and have been ridiculous. The rate of administration should be two litres of oxygen per minute. So the best way to administer oxygen will be to put the patients in oxygen tent.
- 4. Morphia gr. $\frac{1}{4}$ six-hourly and patient is propped up in Fowler's position.
- 5. Suction applied to an in-lying gastric or duodenal tube.

Adrenal cortex therapy and vitamin B administration are beneficial adjuvants.

Conclusions.—1. The present author has shown that pH value of blood may serve as a useful guide towards the onset of paralytic ileus and as a guide to further prognosis and treatment.

- 2. The author has suggested a new plan of treatment in two stages—(a) early or preparalytic or paretic stage, and (b) paralytic stage.
- 3. Administration of oxygen on rational lines seems to have some useful application in the therapeutics of the paralytic stage.

The writer acknowledges his sincerest thanks to Dr. A. C. Ukil, Principal cum Superintendent, Medical College Hospitals, for his kind permission to use hospital records, and to Colonel F. J. Anderson, I.M.S. (retd.), for offering facilities to carry on this work.

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certain beef preparations. One of the substances investigated was Bovril.

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Indian Medical Gazette

OCTOBER

INDUSTRIAL MEDICINE

WE are industrializing and might with advantage go over the medical aspect of industry. In doing so we have to borrow data from European workers because hardly any data are available in our country. These data do not fit exactly into our conditions of work and socio-economic fabric. Our hope is that ultimately they will do so with appropriate modifications in both.

Our labour.—Our labour is derived from the masses which in Asia generally and in India particularly are separated from the classes almost as sharply as the rulers have been separated from the ruled for thousands of years. This is (let us hope, has been) the evil oriental genius which takes the invidious distinction between man and man for granted. Thus far has the labourer progressed and no further.

The same distinction holds between the unskilled and the skilled labour, and between the skilled worker, the overseer and the administrator.

The unskilled labourer is fully conscious of the disadvantage and turns it into an advantage by making his contribution to the industry a casual affair. His heart is in his home in his village. There he lives really. He comes to the foci of industry to get the wherewithal for extending, improving or repairing it. If his home happens to be in the suburbs of a town, where he owns a house as a member of a joint family, he is in his village a landless labourer not employed (—not employed on land in the village) and with him may be living one or two friends (not relations but belonging to the same caste) working in the same mill or factory. These are the well-nourished but unemployed landless labourers seen in the suburbs of Calcutta. They are not doing badly.

Others are less fortunate and in the majority. They live in the slums. As often as not they sicken and die of any disease that is going. Usually it is tuberculosis but it may be malaria, cholera, smallpox or plague. All the deaths in hospital in Calcutta during the short outburst of plague this year occurred among non-Bengalees who provide the labour (Editorial, 1948).

This population, essentially rural in origin and habits, is a problem in towns. These villagers have left their code of sanitation behind and do not understand the town code. The proverbial filth of the bazars begins and ends with them. Those that survive amass cash with which they

build houses of masonry, find brides and bridegrooms for their boys and girls, celebrate births of grandsons and perform the last rites of their parents. The cash fails to improve their standard of living. Even the houses of masonry once built are seldom repaired.

If the unskilled labourer is to make a full contribution to industry he should be persuaded to live a healthy and happy life where he is working. Suitable accommodation, ration and some amenities of life should be provided at a reasonable cost. It may not be easy. The huts built for Bombay mill workers after the First World War were seen crumbling unoccupied many years later. Even in England, in a similar venture, the health of the labourer's family did not improve. The extra rent for superior accommodation was paid by cutting down the milk supply for the family! Some means should be found to overcome the labourer's objections which may not be altogether unreasonable.

Labour absenteeism in India does not appear to be a medical problem.—The usually accepted figure for England (and elsewhere under European conditions) is of the order of 7 per cent of the total planned hours of work (Davies, 1948). In a well-established jute mill near Calcutta-it was also found to be of the same order (Basu Mallick and Greval, 1948). It differed, however, from the European figure in a very important respect. While in Europe the medical and non-medical reasons for absenteeism were about equal in the aforesaid jute mill they were:—

1:3 for skilled labour.

1:9 for unskilled labour.

The figures speak for themselves. The unskilled labourer is not interested in his work. He undertakes it when he has nothing else to do.

The industrialist or rather uncharitably the capitalist.—This problem would not have really interested us at all if the professional man, including the medical man, were not, once upon a time, included in the list of producers of wealth more or less by courtesy only.

'The professions must also be regarded as productive. It is true that they produce nothing material or tangible, but they satisfy human wants. If a farmer is a producer because he produces food, the doctor must be considered one if he helps us to digest the food' (Clay, 1917). The medical man helped one in digesting the food. He was therefore an ally of the producer of wealth and did in fact belong to the same category. So did other professional people.

Now, husbanding of capital is also a profession. If proper qualifications for the profession and limits on its operation could be imposed the differences between the employer and the employed would disappear. Profit sharing which is going to be tried as an experiment in the near future is an attempt in this direction. If it succeeds we will have given a lead to the

materialistic West in an undertaking which is primarily and essentially of their creation. It will make unnecessary the drastic measures which have been taken to liquidate the burgeois.

Two important rôles of a medical man in industry.—They are: (1) To obtain the maximum output of goods from the optimum working of human anatomy and physiology. The optimum must be worked out. For this he must have the well-being of the worker at heart as much as a family physician has the wellbeing of the family at heart. Sanitation. nutrition, prevention of disease, leisure and recreation will constitute his special study. To provide tests in judging disabilities arising from injuries sustained in industry. evidence must be 'horse high, pig tight and bull strong' (Johnstone, 1948). For this he must study the machinery as run in our country. It has been evolved outside India and does not quite fit into the habit complex of the worker. A Western operator sits on a stool in comfort and is relaxed. An Eastern operator perches on a stool with an effort and is far from relaxed. The dress is also different. The climate is, of course, not comparable at all.

The essential rôle and dignity of work.—Work has a social foundation and is an instinct (Davies, loc. cit.) It is not hard labour only by any means. A person works: (1) To carn money to buy articles of necessity and luxury. Money earned and spent is indicative of selfrespect. Money, however, is not the sole object-There is dignity in work. Leisure is also earned the same way. Our masses, however, lack the sense of leisure. The social fabric is such that one's needs, being the needs of a joint family, are hardly ever satisfied. An occasion for thinking of leisure never arises. (2) Because of interest in work. Such an interest can be created or if already present fulfilled. Finding of a job one likes is not always easy. In India the difficulty is increased by the social fabric. (3) To meet other people with similar interest. The place of one's work is one's club. (4) To save one's self from one's self. Almost unbelievable labour has been spent on famous creations under this Thus was compiled the Concordance by Alexander Cruden in 1737. It is as complete to-day as it was over 200 years ago. As a recreation. Alpine climbers of wealth and leisure actually do the work of coolies and run their risks for pure recreation.

Agriculture and industry.—Whether both these undertakings can be run together side by side in a country without interference; whether both the farm and the factory can pay the workers satisfying wages; whether every worker will appreciate the open and healthy life on a farm and forego willingly the extra cash paid in the smoke, dust and noise in a factory, is a point for the economist to decide. In a country where both can thrive the latter will certainly

derive benefit of proper nutrition of the worker from the former. Our country is such a country. Besides factories in operation and in blueprint, it has not only all the raw material and minerals to feed them but also the power to feed the producers and the consumers of the goods produced, at least for the time being. The tropics have more than their fair share of the wealth of the earth and our country has more than her fair share of the wealth of the tropics. (Only our population is a problem: It is at once our strength and our weakness.)

Dangers of industrial system.—The Western industrial system is by no means an unqualified boon. In England and Wales, in 1885, 'nearly half (47 per cent) of the people over 70 years of age died as paupers'. Recently, out of 234 old persons assessed, 91 were found to be suffering from 'material hardship' and 86 from 'some degree of hardship'—total hardship 76 per cent (Mathews, 1947). Human life comes to such an end in highly industrialized countries only. In coming to factories from countryside the workers cut themselves adrift from their families. Following their example the townborn factory workers also cut themselves adrift from their families as soon as they are fit to work. The cohesion of the family life is thus destroyed. In our country there is no such risk for some time to come. Our social system will die hard. In fact we do not want it to die: It should only reform. Let the worker go home to his village for holidays and on retirement and let him continue looking after the old folks. Such will be the advice of the 'social physician protecting the people and guiding them to a healthier and happier life' (Bhore, 1946).

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BY GUM THEY ARE STUCK

'THEY' are letters from Government or semi-Government institutions, banks and insurance companies.

During the war and for a period of nearly three years after the war, when the supply of gum or starch for paste was restricted, the flaps of envelopes of letters and of wrappers of booklets used to be fastened down with a modicum of an adhesive material. This year, however, the policy has been reversed. Gum or paste enough for a double or triple duty is used in fastening the flaps. As often as not the contents are also fastened. Are the gum and starch in superabundance or are the office boys new? If new, were all of them coolies of some sort or other before forcing their way into offices?

Recently even journals coming from overseas have been found to be treated with the same extra liberal allowance of gum. It has not been found possible to open the rolls without damaging the leaves. The infection is comparable to virus infection which unlike a bacterial infection is not bound by geographical limits.

Over the binding of books there has been difficulty in England (British Medical Journal, 24th April, 1948, p. 800; Indian Medical Gazette, 83, p. 189, 1948). Enough female labour is not available and this accounts for the lack of neatness in the binding and smartness in the appearance of the books. Besides, there is a scarcity of cotton, etc., used in binding. The overstuck letters and journals, however, constitute a different proposition. Their pathogenesis has not yet been worked out.

The most annoying objects stuck with gum are typed bits of paper stuck on the inner surface of covers of books sent by American publishers for review. They are stuck with a super gum which refuses to soften with water. On removal they leave ugly abraded surfaces which make the very commencement of the books hideous. Formerly neatly printed slips giving the necessary information used to be pinned to the front page. For this cent per cent avoidable nuisance there is no excuse whatsoever. The printers of books should also be lovers of books and should not disfigure them.

MEDICAL EDUCATION

Ir is proposed to publish articles on the above subject as a special feature in a future issue. Contributions in this connection will be received until the 31st January, 1949. Educationists, critics and others are expected to give their best in this important subject.

Medical News

FACILITIES AVAILABLE IN U.S.A. FOR POST-GRADUATE TRAINING

THE Graduate School of the University of Pennsylvania at Philadelphia is willing to take at least one

post-graduate student for training in each of the following departments, for an intensive course in the subject, lasting for 8 months from 1st October, 1949 :-

General Medicine. Physical Medicine. Pædiatrics. Neurology-Psychiatry. Dermatology-Syphilology. Radiology. General Surgery. Gynecology—Obstetrics. Orthopædies. Urology. Proctology Ophthalmology. Otolaryngology.

The fee for the course will be \$800 for each student for each subject. After the period of training is over it is very likely, though no definite promise has been given that these declaration. given, that these doctors will get resident appointments elsewhere for further practical training.

For the Medical Sciences like Anatomy, Pathology, Physiology, Pharmacology, etc., no fees will be charged and student-doctors can be trained in any of these branches for a period of 1, 2 or 3 years as desired.

Though the courses in clinical subjects will be started from 1st October, 1949, definite registration will

have to be made by the end of January 1949.

2. The George Washington University Hospital at Washington D.C. has given a similar promise to take at least one student in each branch of Medicine and Medical Science. In this case, however, there is no special arrangement for intensive training, but student-doctors will be taken as unpaid fellows (there will be no free board, lodging, etc.) for a period of 2 to 3 years, but there will be no charge for tuition. These fellowships will commence from 1st July, 1949.

Doctors wishing to take advantage of these offers are requested to communicate with Dr. S. C. Sen, 1, Barakhamba Road, New Delhi.

WAR AGAINST CANCER MEDICAL SCIENCE'S NEW WEAPONS By MICHAEL GRANT

(Reproduced from the Circular No. B.F. 105 of the British Information Services, Office of the U.K. High Commissioner in India, New Delhi)

THE increasing prominence of physics and chemistry in cancer research is chiefly due to developments in the technique and theory of radiotherapy, in the use of radio-active isotopes, in the field of microscopy and in the application of physical chemistry to the study of cancer-causing compounds.

Thanks to the endeavours of biochemists in Britain and elsewhere, a great new vista has been opened up by the successes of chemical remedies and it appears that a certain form of cancer can already be controlled by the administration of synthetic drugs. Before coming to any definite evaluation of the chemo-therapeutical method of cancer treatment, it will be necessary to record a larger number of cases than are now available and carefully analyse them over a number of years.

It would be undesirable to talk about a cure as it might be misintepreted and lead to disappointment. might be misintepreted and lead to disappointment. This is why therapists are compelled to state their results with extreme caution. It is, however, highly encouraging, that a surgeon of Lord Webb-Johnson's standing did not hesitate to declare that between 70 per cent and 90 per cent of those treated early for cancer of certain parts of the body have been found completely free from any sign of the disease ton years. pletely free from any sign of the disease ten years afterwards.

Lord Webb-Johnson, the President of Britain's Royal College of Surgeons and a founder member of the

British Empire Cancer Campaign, speaking of the successes of chemical remedies recently, declared that surgeons working on cancer research had the sole object of 'destroying themselves' as surgeons and becoming physicians to control cancer without operation.

The war against cancer is not waged in the limelight and few people outside the medical profession know that the foundation of the chemo-therapeutical treatment of cancer was laid by Prof. Sir Ernest Kennaway, the outstanding United Kingdom cancer research worker of the present century, who 19 years ago discovered the first cancer-producing hydrocarbon. Since then, investigators in Britain have synthesized and tested more than 300 carcinogenic compounds; and in fact studies of these compounds and their mode of action form the largest single group of investigations in progress in the 21 centres of research financed, assisted and co-ordinated by the British Empire Cancer Campaign.

Clinical control

There are two main avenues of approach to cancer research. One is concerned with the influence of viruses on the causation of cancer and the other with the study of chemical carcinogenesis and chemotherapy. The two latter are closely connected as it has been found that cancer-causing and tumour-inhibiting capacity are closely linked properties of certain chemical compounds, somewhat in the same way that radiations in different dosages can either produce or inhibit the growth of malignant tumours.

The number of compounds tested runs now well into the thousands and the large number of papers on chemotherapy presented at the latest international congress shows how intense is the research for some drug which will selectively destroy cancer cells without doing any harm to the others.

Most of the new chemical compounds have been tested on rats and mice, some of them with encouraging results. The new drugs clinically tested on human beings include the synthetic ovarian hormone, stilbostrol, and its derivatives; these substances have enabled the clinical control of cancer of the prostate gland to be carried to a degree unknown before. Several years' work in the treatment of cancer of the prostate by the administration of a few pills daily of the drug confirmed its value in dealing with this type of cancer. Numbers of patients have been and are being rendered virtually symptom-free, which promises a hopeful although probably limited line of cancer therapy.

Artificial radio-active substances such as radio-sodium and radio-phosphorus are being used for tracer element experiments and for radio-therapy. These substances are now being produced in Britain's new atomic pile. They reach the cells in the living human body, and send back signals which will ultimately reveal the process of change from normal to malignant cells. This knowledge will supply medical science with a powerful weapon to fight malignant tumours.

Reduced mortality rate

New developments in the field of radio-therapy include small condenser chambers by means of which the dosage can now be measured directly in the patient during the treatment. Britain already has mass radiography for tuberculosis, and it is hoped that the same type of thing will be done shortly for cancer.

Thus, modern surgery, the use of 'glandular' chemicals, swallowed as tablets, and radiation which was improved by the knowledge gained in the study of atomic fission—all offer important contributions to the campaign, and the disease is already beginning to lose some of its former horrible aspects. In fact, the control of cancer—this phrase being preferred to 'cure'—in certain organs and certain regions of the body can now be achieved with a high degree of certainty. The fact that the mortality rate in cancer of the lip, the tongue, the jaw, the skin, the breast and the uterus,

is falling constitutes an achievement which entitles mankind to ask if this is not 'the end of the beginning'.

Fear has long been one of the greatest handicaps to the cure of cancer deterring many patients from asking for medical advice. According to a recent report of the Holt Radium Institute in Manchester, England, of the patients who came for treatment when the disease was in an early stage 87 per cent were free from a recurrence of the affliction during the five years' observation period; whereas the cures shrink to 7 per cent in cases where the disease was already advanced before treatment was started.

The search for a single cause of cancer is still without success, but much is known of contributory factors, and certain types have been experimentally produced. There is still no certain 'cure' but treatment by combined methods is certainly more hopefully employed than before the war and new developments promise even better results in the future.

NEW HOPE FOR THE PARAPLEGICS Success of British Training Methods

(Reproduced from the Circular No. BF. 142 from the British Information Services, Office of the U.K. High Commissioner in India)

There are two schools of thought in the treatment of paraplegics (those suffering from the paralysis of the lower limbs through an injury or disease of the spinal chord). In America, though the patient is treated quite as carefully as in Britain, the ideal is to surround him with every amenity so that he has to do nothing for himself. In Britain the view is held that total physical incapacity cannot be regarded as merely affecting the physical functions: the psychological harm of a feeling of complete incompetence and dependence upon others can be enormous.

The British Ministry of Pensions, therefore, tries to make the paraplegic as self-reliant as possible. A man who feels himself important to the community is a happier man than one who feels himself a burden.

The Ministry of Pensions hospital at Stoke Mandeville has been pioneering for some time in this aspect of care for the paraplegics, and before the end of the last war had assisted many to conquer their handicap with such success that some whose plight would normally be accepted as hopeless and helpless were engaged as part-time workers in light industry.

Such progress has been made that of the some 600 victims of paraplegia from the last war only 200 were still in hospital by June 1948: of the rest 70 per cent were in full and regular employment. What this means in happiness to the victims themselves can be well imagined.

Special hostel

The intention has always been that special hostels should be provided for the paraplegics during training. This aim is soon to be realized by the completion of the Ministry of Pensions hostel at Osterly (Middlesex).

The planning of the hostel has been based upon the experience gained by the Ministry's doctors at Stoke Mandeville and the building was begun a year ago by the Ministry of Works. Nothing quite like this hostel has been seen before—neither in Britain nor elsewhere.

It is all on one floor and there are 72 beds in eight wards warmed from panels in the ceilings. The doors and corridors are wide enough to permit the passage of hand-propelled chairs and the rooms are lofty. One touch of the finger is enough to open or shut the doors which move sideways on ball bearings. All furniture is designed to be just the height for men in wheeled chairs, and ropes and pulleys, or similar apparatus are provided by which the patients can lift themselves

in and out of the bed or bath and in and out of their chairs. A bathing pool is planned in the grounds.

Motor tricycles

Under the present regulations each paraplegic is provided free with a motor tricycle or motor chair. At the hostel a door leads from the dining room into the garage where the motor-propelled chairs will be garaged. The men will set out for their factories after breakfast and transfer themselves at their work into hand-chairs.

During the next two years a limited number of seriously disabled pensioners will have the option of exchanging their tricycles for a small motor car. Paraplegics are among this number, and it is expected that most of the Osterly residents will prefer the car: eventually the hostel may provide garaging and service

These specially-designed cars—all foot pedals being eliminated and replaced by hand controls-will have several advantages for the crippled. He can take out his family; he can transport his hand-chair in the back; and he is protected from the weather.

By the Ministry's efforts paraplegia has become merely a change of life—not the end.

MICROFILM SERVICE UNITS SET UP BY THE INDIAN RESEARCH FUND ASSOCIATION AT RESEARCH INSTITUTE, CENTRAL KASAULI, AND AT THE TATA MEMORIAL HOSPITAL, BOMBAY

(Reproduced from the Circular No. F-8/OSR(2R)/48-908, dated 14th October, 1948, from the Department of Scientific Research, Government of India, New Delhi)

In the U.S.A., libraries are employing increasingly the practice of making copies of printed material from books or periodicals on a film like that used in cinematography. Such films are exceedingly compact both for storage as well as for transport. For example, a 100-foot roll of cine film that can slip into an ordinary coat pocket can copy the contents of about 1600 pages of material from books or periodicals. Such films can be projected on a compact ground glass screen, 12 inches by 12 inches, by a special instrument known as a 'Reader'. Such 'Readers' are available in most of the progressive libraries in the U.S.A. The 'Readers' can be utilized if needed to obtain Photostat copies on paper for use of Institutions not provided with 'Readers'. The service is called 'Micro file' film service.

A central library organization should possess a copying equipment called a 'Recorded' which will make copies of printed materials on cine film for distribution. This central organization as well as libraries and institutes and colleges should each possess a 'Reader' to read microfilmed articles.

Only a limited number of medical and scientific journals are received in India and for this reason many workers are deprived of reading important research articles on various subjects. To overcome this handiarticles on various subjects. To overcome this handicap, the Indian Research Fund Association have set up a Microfilm Service Unit at the Central Research Institute, Kasauli. This unit is capable of undertaking filming of articles from any journal available in libraries in India. The membership of this service is not restricted and institutes or libraries wishing to take advantage of this service can do so by joining the service on payment of an annual subscription of Rs. 25. For this subscription, members are entitled to have For this subscription, members are entitled to have any articles which they require microfilmed at a charge of one anna per page plus postage.

The following institutes have joined the Microfilm Service Unit :-

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Nutrition Research Laboratories, Cooncor.

Pasteur Institute, Coonoor.
Stanley Medical College, Madras.
O. C. Command Laboratory, Bangalore. 8. 9.

10.

Grant Medical College, Bombay.
All-India Institute of Hygiene and Public Health, Calcutta. 11.

King Institute, Guindy, Madras.

School of Tropical Medicine. Calcutta.
Seth G. S. Medical College, Bombay.
R. G. Kar Medical College, Calcutta.
Director, Combined Inter Services Historical 13. 14.

15. 16. Section, Ministry of Defence, Simla.

The Indian Research Fund Association have also sanctioned funds for setting up a Microfilm Service Unit at the Tata Memorial Hospital, Bombay, but the equipment required for the unit has not so far been received. It is hoped that this equipment would be received shortly when the unit will start work.

To make use of the microfilmed articles, medical colleges, research institutes, etc., will require a 'Reader'. The cost of a 'Reader' is about Rs. 300 and this equipment can be obtained from Messrs. Kodak and Co, Ltd., Kodak House, Hornby Road, Bombay.

The Indian Research Fund Association Microfilm Service at the Central Research Institute, Kasauli, can, besides serving the medical colleges and research insti-tutes in India, also microfilm articles required by the various ministries of the Government of India. The Ministries of Education, Agriculture and Scientific Research will in particular be interested and may like to notify the research institutes and other bodies working under their ægis that the Indian Research Fund Association Microfilm Service Unit at the Central Research Institute, Kasauli, would undertake the microfilming of such literature as might be required by them from time to time.

BOMB ATTACK ON MOSQUITO AND TSETSE FLY

HELICOPTERS FOR 'OPERATION MALARIA' By PAUL WEST

(Reproduced from Release No. B.F. 150, issued by the British Information Services, New Delhi)

THE war on tropical diseases is being waged with all the resources at the command of science and engineering.

Almost unknown to the world, British Guiana and Uganda have been ceaselessly battling since 1945 against the mosquito and the tsetse fly with powerful weapons like D.D.T. and gammexane. Spraying the interior of buildings and treating relatively isolated areas with insecticide smoke have already brought the pests under control, with encouraging results in the health of the people.

The success of these campaigns has dictated their application in other tropical areas, like the island of Mauritius.

Experience has shown, however, that the use of ground equipment for the dissemination of insecticides is inadequate for the treatment of dense, inaccessible jungle, or of large tracts of country. In such areas aircraft appear to offer a more reliable means of distributing the poison in such a way as to destroy the pests.

Although, during World War II, aircraft were used on a large scale for spraying insecticides, a really efficient technique has not yet been evolved for application to tsetse flies. Much further investigation is

necessary, and it has been decided, therefore, to undertake a series of experiments in East Africa, which are due to begin this autumn. For this purpose low-flying Anson aircraft of Britain's Royal Air Force will be used.

The aircraft will be equipped with spray gear, tanks, and smoke generators. The spray gear and tanks have been designed by the Chemical Defence Experimental Establishment, at Porton, near Salisbury, in the south of England. For the experiments D.D.T. and gammexane will be used in various solutions and emulsion with a view to finding the most effective form of these insecticides.

In one case the area selected for the experiment will be sprayed with D.D.T. and gammexane smoke produced through the exhaust of the engine. Each acre of land is to be treated eight times, at fortnightly intervals, with a quarter-of-a-pound of D.D.T.

Insecticide bomb

Another experiment will consist in defoliating the bush. It is known that the tsetse reacts sharply to any changes occurring in the character of the bush because of their influence on temperatures and humidities. A partial defoliation of the forest, achieved by spraying it with chemicals, might well produce conditions sufficiently uncongenial to the insects to cause them to leave the district.

One of the later developments will be trials with an insecticide bomb with which it is hoped to achieve a deep penetration of the bush. This bomb, designed by the Chemical Defence Experimental Station, Porton, contains a cluster of smoke generators. Its purpose is to penetrate the bush canopy and afterwards to produce clouds of smoke, which, rising from the ground and spreading in all directions, will permeate the jungle.

One difficulty is that broken country intersected by hillocks and gorges makes it impossible to obtain a distribution using aircraft of the ordinary types. To ensure a more effective penetration of the bush with insecticides it is proposed to experiment with helicopters. On the recommendation of the Colonial Insecticides Committee, a grant has been made for the purchase of a suitable helicopter. The Committee has proposed a three-rotor, two-engined helicopter carrying a four-ton load. This aircraft is now under construction, and is expected to be ready for service towards the end of 1949. Preliminary work, however, will be carried out before this date with a single-engined helicopter of the same type.

Fighting the Froghopper

In July last, a British firm, at the suggestion of the Colonial Insecticides Committee, began to use a helicopter in an experiment to combat the froghopper pest in Trinidad. The froghopper is a small jumping insect bearing some slight resemblance to a frog. The damage caused by it to the sugar plantations in a bad year involves the loss of 15,000 tons of sugar, and the plantations look as though they had been destroyed by fire. The insect pierces the leaves of the sugarcane and sucks the juice, using for that purpose its hollow proboscis, so that ordinary insecticides sprayed on to the leaves are ineffective.

The problem, then, was to produce an insecticide that would penetrate the skin of the insect; and this insecticide was found in a powder containing benzene hexachloride. The experiments carried out with the helicopter show that the treatment of an acre of sugarcane with 30 pounds of insecticide dust gave 100 per cent kill of adult froghoppers.

The Colonial Insecticides Committee with the cooperation of Britain's Ministry of Supply has organized a team of scientists for insecticide research at Porton to study some of the fundamental problems connected with the control of insect pests that have arisen during experiments in the field. In the course of the experiments carried out in Uganda it transpired, for example, that certain insecticides were absorbed by the vegetation, or by mud or the thatch of houses, and that they lose their lethal properties when exposed to the rays of the sun.

In dealing with such diseases as malaria and sleeping sickness, spectacular successes cannot be achieved overnight; but considerable progress has undoubtedly been made, thanks to the initiative and energy of the Colonial Insecticides Committee with grants from research funds provided under the Colonial Welfare and Development Act.

MOBILE HOSPITALS PLAN FOR HYDERABAD (Abstracted from the *Prescriber*, Vol. XLII, No. 6, June 1948, p. 78)

An interesting plan for mobile hospitals, designed to provide full medical aid for rural populations which are out of easy reach of existing hospitals, has recently been put into operation by the Medical Department of Hyderabad.

Each mobile hospital is a self-contained unit of about 100 beds for in-patients under canvas.

These mobile services, which are expected to cost £26,000 annually to maintain, have been inaugurated by the Government of Hyderabad after very careful consideration of the special problem of providing medical aid for the scattered, ignorant people in remote localities. The scheme was first tried out with two mobile units, and the result was so successful that it has now been adopted for the whole of Hyderabad.

IIn view of the admittedly disturbed conditions in the State about that time the statement, obviously, is not in accordance with facts.—Editor, I.M.G.]

A NEW ANTI-ANÆMIC FACTOR

(Abstracted from the South African Medical Journal, Vol. XXII, No. 10, 22nd May, 1948, p. 346)

RECENT clinical tests on 80 patients in the United Kingdom have revealed the existence of a very potent remedy effective in cases of pernicious anæmia. The concentration of the active principle was achieved by Dr. Lester Smith, who obtained one gramme of the substance from four tons of liver.

Dr. Smith's results are reported in a recent issue of *Nature*, and Dr. C. C. Ungley of Newcastle confirms that even very difficult cases respond to minute doses, beneficial results being apparent within a fortnight but a feeling of well-being occurring much sooner.

The drug is apparently active in a dosage of about 0.15 mg. Another remarkable feature is the claim that, unlike folic acid, it not only restores the red cells in pernicious anæmia, but also corrects nervous disorders and deterioration of the spinal cord.

Further details about these remarkable claims will be awaited with great interest.

F.R.C.S.E.

(Abstracted from the Lancet, 10th April, 1948, p. 567)

HITHERTO candidates for fellowship of the Royal College of Surgeons of Edinburgh have sat a single examination. Now, however, the examination is to be divided into two parts. The first part will be on anatomy and physiology and on pathology and bacteriology, while the second will be on the principles and practice of surgery and on one subject to be chosen by the candidate from the following: (1) surgical pathology and operative surgery, (2) laryngology, otology, and rhinology, (3) obstetrics and gynæcology, or (4) ophthalmology. The new regulations come into force at the beginning of next year; but unsuccessful candidates who appear for examination on or before 15th March this year will still be able to opt for examination under the existing regulations.

Public Health Section

THE PLACE OF VASECTOMY IN LEPROSY CONTROL

By A. T. ROY
Purulia Leper Home and Hospital
Purulia

Introduction.—On scrutinizing the religious bindings on a particular society, especially in India, it will not be difficult to find that those bindings are more or less connected with health and happiness of that society. But examples of relaxations of those bindings with the advancement of knowledge are not very uncommon. At the All-India Leprosy Workers' Conference, Wardha, in October 1947, Dr. Dharmendra of the School of Tropical Medicine, Calcutta, read a paper on 'The place of vascetomy in leprosy control'. It was followed by scientific discussions.

The plea for writing this paper is to show that the control of leprosy does not mean only to give shelter to the poor, incapable, mutilated patients, but it is closely interlinked with the control of spread of infection among children who are very susceptible to the disease.

Our observations.—Some patients discharged from a colony built houses near it and settled there. Gradually some beggars suffering from leprosy also joined them. There are now 62 families and 44 children.

After a good survey it was found that except 13 couples who were burnt out cases, in all the other couples either one or both were lepromatous (i.e. infectious). Out of 44 children, 22 were living with parents. Nine out of these 22 have already developed leprosy. The fate of the other 13 is as gloomy as possible.

Discussion.—It is a known fact to the leprologist that the increase or decrease of the incidence of leprosy in a locality depends on the increase or decrease of the disease in children. If this be an admitted fact, should we not think on the following lines to decrease the child incidence?

- (1) Strict separation of male and female cases to prevent conception.
- (2) To separate the children of infectious parents after birth.
- (3) To stop pregnancy by artificial means.

 1. Strict separation.—In most of the colonies patients of both sexes take part in the cultivation, weaving, schooling, etc., according to the present system in the colonies. Strict separation of patients according to sex is impossible. The only way to keep them separate is to make colonies for one sex only which is not very easy and which has not been thought of at all.

2. Separation of children.—This saves undoubtedly a great number of children. But

- it entails a huge financial responsibility. Mr. Miller, Secretary, Mission to Lepers, said in the Conference of 1936 that The voice of medical science says to us of the healthy children of lepers, get hold of them early, earlier, at the earliest. They are in grave peril till you do'. 'It tells us, if we would save the children, we should not wait the day when they are brought to us in their leper parent's arms, but somehow we should go out into the high ways to seek and to save them before they are lost, so very often, to freedom from infection'. Our experience in the field tells us that we have advanced very little and we have saved very few children in spite of all our agility for the cause. Until and unless elaborate arrangements are made by the government or by voluntary organizations, the infection of children cannot be brought under control.
- 3. Stopping pregnancy.—This will stop the increase in the incidence of leprosy among leprosy patients by sterilizing one of the partners, preferably, the male partner by vasectomy. To make this idea popular, various workers worked hard on it and came to the following conclusions:
- (i) Vasectomy in lepers is indicated as a preventive method, and that it has no influence on the sex desire of patients (Mitsuda, 1937).
- (ii) Vasectomy was done on 385 cases and that the measure has proved effective in preventing conception but sterilization of patients does not influence the disease (Fijita, 1939).
- (iii) Vasectomy, a simple operation, has no influence on sex desire (Komi, Kawa, 1939).
- (iv) Fernandaz (1934) considers that marriage cannot be avoided in the isolation colonies, and that contraceptive methods, including the sterilization of cases, should be made known to the patients beforehand.
- (v) That the strict segregation of sexes in the leprosy institution was difficult or impossible with the result that many illegitimate children were born who were liable to be infected. Moreover many patients left the institution because of the restriction of married life, lived in camps and produced children, a large number of whom got infected. In 17 couples when married without any previous vasectomy of the male partner. 9 couples have had babies and in 5 of the women the disease had relapsed on account of the strain of pregnancy and lactation (Wilson, 1935-36).
- (vi) That owing to the difficulties in backward tropical countries in the separation of infants from their leper parents early enough to prevent the possibility of their infection, the most effective method of preventing married patients

begetting children is by sterilization of the male partner by vasectomy (Muir, 1940).

With the above findings and with our practical experience we feel that the only way to minimize the child incidence is by sterilization of leprosy cases, which is very easy to perform and very effective.

Summary.—The necessity of sterilization of the leper patients has been pressed for the following reasons:—

- 1. That with the present system of taking care of the leprosy cases, the only way to lessen the child incidence is by sterilization.
- 2. That sterilization does not influence the disease.
- 3. That the disease does not get the chance to relapse on account of the strain of pregnancy and lactation.
- 4. That it has no influence on sex desire of the patients.

Conclusion.—As the children of the leprosy cases can be saved with great difficulty from the infection and as the increase in the incidence of child leprosy denotes the increase of the leprosy incidence in a locality, the question of sterilization should be given importance. Preference should not be given to sentiments over the opinion of the workers in the field.

The Indian Medical Gazette fifty Years Ago

SUPPLY OF MILK

(Reprinted from the *Indian Medical Gazette*, Vol. **33**, October 1898, p. 382)

THE supply of milk in many Indian cities appears to be quite insufficient for the demands of the inhabitants, consequently it is a recognized custom among milk vendors to vary their prices according to the number of seers for the rupee, so that if six seers are given of pure milk then seven, eight, or nine will be delivered at the same price but of a different quality. That is to say, water is added to the milk in order to suit the quantity and the pocket of the buyer. watering of the milk is an understood thing and, as we well know, the danger lies in the condition of the water is added. In this particular milkmen are by no means careful; they do not profess to sell pure milk at the prices given by the public, but they might at least take the trouble to see that the water is pure. There are other points, however, to which attention should be drawn; first the vessel used for receiving the milk is usually a lota made of brass of such a shape, that the person who carries it, when empty or full, puts his dirty thumbs inside the margin—generally in fact into the milk itself—thus contaminating it in

a variety of ways. To prevent this a vessel with a suitable handle should be used instead. Next, if any quantity of milk has to be carried to a distance, the large lotas containing it are suspended from each end of a bamboo pole carried across the shoulder, like a milkman's yoke; small quantity of hay is placed in the mouth of each lota; this of itself may be a source of contamination, but the chief risk is from the dust and dirt of the streets through which the milk is borne. Carried in this way through the streets of a large city any quantity and variety of dirt may be introduced. If vessels are to be carried in this way, they should be properly covered by metal caps so that no foreign matter can possibly find its way into the milk. The cleanliness of the milkman himself is not apparently considered by the natives to be of any importance, precautions should, therefore, be taken as the goalla is by no means personally clean. His hands will not bear inspection, and he does not take the trouble to wash them unless he is supervised. In private houses this can be done when the master or mistress is present at the milking, but no native servant can ever be trusted to see the instructions carried out. Many people think it is hardly possible to get either good milk or butter in India; but if a cow or buffalo cow is kept on the premises, carefully fed and milked, it will be found that this is a mistake; much depends on the house-keeping qualities of the mistress and, if well fed, the percentage of cream may be equal to and the taste of the milk almost equal to that of average English milk. To ensure the making of good butter which is usually made by the simple process of shaking milk in a bottle, it is necessary to see that the bottle and its stopper are scrupulously clean or disagreeable taste will be present. Cork cannot be well cleaned, but a rubber stopper can be kept quite sweet with care, while the fine cloth used for straining should be properly boiled or the butter will be tainted. With a little trouble capital milk and butter can be procured in most Indian stations; when this is not the case among fairly well-to-do people, the fault lies with the servants of the house or the mistress who do not properly supervise the ignorant and often dishonest milkman.

Current Topics, Etc.

Further Reports on Weil-Felix Reaction in Kala-azar

By Captain D. J. REDDY, M.B., B.S. (The Antiseptic, June 1948, p. 393)

I REPORTED in January 1947 issue of The Antiseptic 6 cases of kala-azar with special reference to serological

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CATAZOL-E containing Camphor 0.75%, Eucalyptol 0.75%, Menthol 0.5%, Ephedrine 0.5%, and Liq. Paraffin qs. reactions in kala-azar. It was found that in 4 out of the 6 cases reported, sera agglutinated OXK suspensions to a diagnostic title of 1/320 and above and in a few the titre rose up to 10,000. In all these cases Leishman-Donovan bodies were demonstrated either in sternal marrow or splenic smears. Particular attention was paid to exclude scrub typhus which is endemic in Burma where this investigation was carried out.

This work was pursued further and two more case reports are given above with conclusions. These cases were admitted to a General Hospital in Burma in late 1947. In both Leishman-Donovan bodies were demonstrated and complement-fixation test for kalazar was positive. In both diagnosis was missed when they first reported for febrile attacks and it was only on their second visit to the hospital, a thorough investigation was carried out and a diagnosis of kala-azar made.

Both of them responded well to a course of ureastibamine.

Conclusion.—The sera of both patients gave a titre of 1/640, and 1/320 against OXK suspension; thus confirming preliminary findings reported in early 1917. Although a positive Weil-Felix reaction against OXK suspension is confronted in certain febrile states other than scrub typhus, the titre is not commonly over 1/80 and not often reaches a diagnostic titre of 1/320 and above. But such findings seem to be common in kalazar. It might be fruitful to carry out Weil-Felix reaction against OXK suspension on sera which have a high globulin content in other diseases.

The following four abstracts are reproduced from Medical Newsletter No. W.-673, July 1948, prepared by the American Medical Association:—

Transient Cerebral Paralysis in Hypertension

Pickering states that hypertensive encephalopathy comprises at least two distinct clinical and pathologic conditions. In acute hypertension or chronic hypertension with recent exacerbation, attacks of headache, vomiting, convulsions and coma are generally due to acute ædema of the brain; this ædema is less likely to be caused by excessive constriction of the cerebral arteries, as is now commonly held, than by defective constriction, as originally supposed. In chronic hypertension attacks of localized sensory or motor paralysis of brief duration are probably not due to cerebral arterial spasm but to sudden organic arterial occlusion, for example by a thrombus.

The speed and completeness of recovery from paralysis will depend on the size of the final infarct and on its position. The arguments for this hypothesis are: 1. The cerebral arteries have comparatively poorly developed muscular walls. 2. They constrict feebly to known vasoconstrictor agents. 3. In 11 patients with chronic hypertensive encephalopathy no sharp dividing line was found between attacks in which paralysis lasted only a few minutes and attacks from which complete recovery did not occur. In 11 patients embolic occlusion of cerebral arteries produced attacks that were precisely similar in kind and range to those occurring in hypertension.

(Pickering, G. W., University of London, London, England: Transient Cerebral Paralysis in Hypertension and in Cerebral Embolism. J.A.M.A., 137, 423-430, May 1948.)

Kernicterus

The authors review the literature and report their findings in a study of seven cases of kernicterus, all of which were associated with erythroblastosis fætalis. This condition was confirmed by means of serologic and histologic studies. In five cases the infants were Rh positive and the mother Rh negative with anti Rh agglutinins. In one case the erythroblastosis was presumably due to the A factor; in another case the erythroblastosis was due to the Rh" factor. Slow

movements of the extremities, suggestive of choreoathetoid movements, were recorded in one case. In five cases jaundice appeared during the first day of life; post-mortem studies disclosed the discoloration to be present most frequently in hippocampus, basal ganglia, midbrain, medulla and floor of the fourth ventricle.

In regions grossly bile-stained the nerve cells were shrunken and stained readily with eosin, some containing dark staining nuclei. Some nerve cells displayed poorly stained cytoplasm and vacuolization. These alterations are not improbably the result of venostasis. No alterations of the glia cells, microglia, or connective tissues were detected. In two cases there was yellow pignient present in scattered nerve cells in the hippocampus, basal ganglia, pons, cerebellum (Pukinje cells) and medulla obiongata (olives). Perivascular aggregations of undifferentiated neuroepithelial cells were found scattered in their usual distribution. Extramedullary crythropoiesis, chiefly in the liver and spleen, and visceral hæmorrhages were other anatomical findings.

(Becker, Paulo F. L., and Vogel, Peter, New York, N. Y.: Kernicterus. A Review with a Report of the Findings in a Study of Seven Cases. J. Neuropath and Exper. Neurol., 7, 190-215, April 1948.)

Streptomycin in Tuberculosis of Bone and Joint

Bickel and his associates report sixteen patients with tuberculosis of bones and joints who were treated with streptomycin. Three patients have involved Sinuses were present in four cases before streptomycin therapy was begun. The average duration of treatment was 112 days. The average total dose of streptomycin (0.75 to 2 gm. daily) was 134 gm. Mild to moderate toxic symptoms were found in nine of 16 patients.

In only one patient were symptoms severe enough to warrant discontinuing administration of the drug. Response to streptomycin was considered favourable in nine cases and fair in one case; there was no benefit in four cases, and the therapy was too recent to evaluate in two cases. Considering the great difficulty which has been encountered in the treatment of similar conditions in the past, the authors were encouraged with their preliminary survey. They feel that 1 gm. of streptomycin daily for 90 days is a satisfactory course of treatment in the light of present knowledge.

(Bickel, William H., Mayo Clinic, Rochester, Minn.: Streptomycin in Tuberculosis of Bone and Joint. J.A.M.A., 137, 682-687, June 1948.)

Technical Aspects of Therapeutic Malaria

Kaplan and Read state that the technical refinements of the treatment of neurosyphilis with induced malaria have long been overlooked. An appreciation of these aspects of treatment will lead to a sound clinical approach to the problem, to an understanding of the immune mechanisms involved, and to the wider adoption of techniques which are relatively simple and which aid in the production of satisfactory courses of the disease. The quantitative parasite count eliminates confusion and waste of time in the use of therapeutic malaria by materially aiding in determining the severity of a given malaria infection and the degree of the patient's resistance, in rapidly forecasting an immune response requiring intervention and retreatment without wasteful weeks or months of observation, and in the rather precise regulation of the febrile course by facilitating quantitative inoculations.

Heterologous strains of \hat{P} . vivax have been shown to produce sufficient clinical activity in previously vivax-infected individuals to allow their routine use for the reinoculation of white neurosyphilis natients experiencing partially immune types of original infection (five to eight paroxysms) thus eliminating the undesirable use of quartan strains for reinfection.

Criteria for malaria inoculations in the treatment of neurosyphilis have been established: (1) White patients with a history of malaria, individuals from the Mediterranean area, Puerto Rico, or highly endemic malaria zones, and all Negroes should be primarily inoculated with quartan malaria, intravenously in large doses (more than 10,000,000 parasites). (2) All other white patients without a history of malaria should be primarily inoculated with vivax malaria, intravenously in doses of 1 million parasites. (3) Patients in group B who develop partially immune responses with less than five paroxysms should be reinoculated with quartan malaria. (4) Patients in group B who develop partially immune responses with five paroxysms or more should be reinoculated with heterologous strains of vivax malaria. Sodium bismuth thioglycollate (thiobismol), which inhibits partially grown parasites, can be employed to regulate both vivax and quartan infections when irregular cycles occur.

(Kaplan, Lawrence I., New York, N. Y., and Read, Hilton S.: Technical Aspects of Therapeutic Malaria. Am. J. Med., 4, 846-855, June 1948.)

The following four abstracts are reproduced from Surgical Newsletter No. W.674, dated July 1948, prepared by the American Medical Association:—

Indications for Sympathectomy in the Treatment of Hypertension

Findley maintains that sympathectomy for hypertension has not as yet been placed on a rational basis; that it seldom, if ever, produces manometric cure; that it is often followed by spectacular amelioration of symptoms; that the results are apt to be temporary; and finally that this treatment is violent. Until these points are properly appreciated and the limitations of sympathectomy thus recognized, the indications for surgical intervention will remain confused in the minds of many.

Since the cause of essential hypertension is unknown, all therapy is empirical. The one known basic fact is that elevation of blood pressure is due to increased peripheral resistance, but there is as yet no agreement as to whether the arteriolar constriction is of humoral or nervous origin. There are many factors in the normal organism which play upon smooth muscle in such a way as to increase its tonus. The author presents a diagram which illustrates the fact that clinical hypertension does not occur until the sum of these vasoconstrictor influences exceeds a certain threshold. Constitution, arteriosclerosis, renal function, nervous system, endocrine organs and pregnancy are some of the factors that may exert vasoconstrictor influences.

The author believes that any enlargement of the vascular bed which follows sympathectomy is probably temporary because of the capacity of the peripheral vasomotor apparatus to regain its former tone and size. In his experience with about 100 hypertensive patients who have been subjected to bilateral splanchnic ctomy and excision of both sympathetic chains from the fourth or fifth thoracic through the second lumbar ganglia, nothing resembling a 'cure' was ever seen. Invariably, the blood pressure slowly rises after the operation to or somewhat below the pre-operative level.

The author believes that patients should not be selected for operation solely on the basis of tests which measure only blood pressure fluctuations. Certainly such procedures as the cold pressure test, the amytal sedation test, splanchnic block, and the induction of high spinal anæsthesia have proved notoriously unreliable as gauges of post-sympathectomy results. He recommends that the operation be reserved for those with severe symptoms but no gross impairment of cerebral, cardiac, or renal function; that the operation not be done on young individuals with mild asymptomatic hypertension because of the possibility of nerve regeneration; that sympathectomy may profitably be

done on patients over 50 years of age, provided other requirements are met, and that patients be told that sympathectomy offers palliation and not cure.

(Findley, T.: Surgery, 23, 639-643, April 1948. The author is connected with the Departments of Medicine, Tulane University School of Medicine and the Ochsner Clinic, New Orleans, La.)

Adenoma of the Bronchus: Review of 15 Cases

Naclerio and Langer point out that during the last decade an increasing number of bronchial adenomas have been discovered, the condition now being recognized as a definite clinical and pathologic entity. This tumour, which accounts for approximately 80 per control of the benign bronchogenic growths, is still a subject of much controversy and as yet no unanimity of opinion exists regarding its histologic origin, potential malignancy, relationship to cancer of the bronchus and its proper treatment.

In the early stages the disease is usually asymptomatic but not infrequently, a dry, irritating cough is present. Hæmoptysis is a cardinal symptom. In women the attacks may coincide with the menstrual periods. Later, as the tumour encroaches upon the lumen of the bronchus, symptoms of partial or total obstruction may appear. A localized wheeze may be noticed by the patient. Dyspnæa is another frequent symptom present at this stage. Usually there have been episodes of pneumonia characterized by cough, mucopurulent sputum, fever and chest pain. These attacks of pulmonary infections are usually severe and slow to resolve.

As the tumour progresses, filling the lumen of the bronchus, obstructive effects with irreparable damage to the lung develop, as in bronchial carcinoma, so that the clinical picture is then one of either atelectasis, bronchiectasis, lung abscess or empyema.

The diagnostic procedures evaluated by the authors include plain roentgenography, section roentgenography, bronchography and bronchoscopy, the last being still the most decisive single diagnostic procedure available.

Histologically, bronchial adenoma is characterized by the rarity of mitotic figures, tendency for the cells to be grouped and uniformity of cell type. It is marked by variability of form. The cells are small, cuboidal, polygonal and contain a dark nucleus. They are grouped in a variety of patterns which may be alveolar, columnar, nodullary or mosaic in type.

The authors evaluate radiation therapy, bronchoscopic and surgical treatment and then present the case histories of 15 patients treated and cured by pulmonary resection, 10 by pneumonectomy and five by lobectomy. They conclude that bronchial adenoma is a disease that should be treated either by lobectomy or by pneumonectomy.

(Naclerio, E. A., New England Deaconess Hospital, Boston, Mass., and Langer, L.: American Journal of Surgery, 75, 532-547. April 1948.)

Acute Pneumocholecystitis

Heifetz and Senturia define pneumocholecysitis as an acute infection of the gall bladder characterized by the production of gas within the gall bladder lumen. The term acute pneumocholecystitis seems preferable to 'pyopneumocholecystitis' as advocated by Simon, since there is no certainty that all cases have pus in association with gas. The name 'emphysematous cholecystitis' proposed by Schmidt and Stevenson also lacks inclusiveness since the emphysematous pericholecystic infiltration of gas is not invariably present.

That gas-forming organisms are frequent inhabitants of the biliary tract has been known for years. Besides the clostridium perfringens, other gas-forming organisms, often difficult to classify, may exist in the bile tract. For the most part they seem to exist as harmless saprophytic inhabitants.

Examination of the literature of the last 45 years has uncovered only eight bona-fide cases of acute pneumocholocystitis. These eight cases are reviewed and two cases diagnosed pre-operatively are added.

One would suppose, in consideration of the usual picture of gas bacillus infections elsewhere, that acute pneumocholecystitis is a fulminating and invariably fatal disease. This was not true. The composite picture is one of persistent acute upper abdominal pain, usually after previous attacks of pain associated with the gall bladder. The temperature is elevated but not to a high degree. Tenderness and rigidity are prominent features, and when the rigidity permits, the gall bladder and occasionally the liver edge can be felt. When icterus is present, it is not severe. This picture of acute inflammation of the gall bladder is not unlike that of other cases of acute cholecystitis or empyema of the gall bladder. In fact, there is little to indicate how cases of acute pneumocholecystitis can be distinguished without roentgenology from the general run of acute gall bladder infections without the presence of gas in the gall bladder. There is, however, a tendency for the inflammatory signs to persist, and failure of the attack to resolve would lead one to consider the development of gangrene and perforation, complications which certainly do not depend upon the existence of a gas infection. It is evident, therefore, that the presence of gas in an acutely inflamed gall bladder is an incidental finding, although its presence makes for additional problems.

makes for additional problems.

Bacteriologically, no constant distinctive organisms are demonstrable. Surgical therapy alone is effective since the gall bladder wall is subject to greater tension when gas is present and there is a consequent greater risk of gangrene and perforation.

Polyvalent gas antiserum, sulphonamides, penicillin, and roentgen therapy are of questionable value in the management of acute pneumocholecystitis.

Routine scout films of the gall bladder area in clinical cholecystic disease will aid in the recognition of this distinctive form of acute cholecystitis.

(Heifetz, C. J., St. Louis, Mo., and Senturia, H. R.: Surgery, Gynæcology and Obstetrics, 86, 424-433, April 1948. The authors are connected with the Departments of Surgery and Radiology of the Jewish Hospital of St. Louis.)

Pulmonary Resection for Abscess of the Lung

Glover and Clagett say that during the 10-year period from January 1937, to December 1946, pulmonary resection has been performed in 37 cases of lung abscess at the Mayo Clinic. These cases were taken from a large number in which resection was performed for pulmonary suppuration. They represent only those in which the diagnosis from the onset was that of lung abscess, exclusive of underlying pathologic changes such as pre-existing tuberculosis, inalignant lesions, or bronchiectasis. All cases considered in this paper are those in which the patients were well before the present illness, without history of previous pulmonary disease, and in which disease began with acute symptoms, during which the diagnosis of lung abscess was made primarily, and progressed to various stages of chronicity under medical management including repeated bronchoscopic aspirations and dilatations, chemotherapy and administration of penicillin.

In 20 cases abscess occurred during the course of a respiratory infection, usually stated as being pneumonia. The presenting symptoms in all 20 cases were chills, fever, cough, sputum, frequently blood-tinged, and pleurisy. In 11 cases the abscess followed the administration of an inhalation anæsthetic agent, most frequently in operations about the mouth, such as tonsillectomy, extraction of teeth and drainage of sinuses. In five cases a foreign body was found in the resected specimen; in three of these the history of aspiration had been obtained, but in two this finding

was totally unsuspected. In the one final case the abscess followed an injury to the thoracic wall, in which a segment of rib had pierced the lung, causing hæmoptysis, infection, and cavitation but no hæmothorax.

The average clapsed time from diagnosis to resection for the 37 cases was 18 months, the extreme being 11 years. There were two cases of partial resection, 16 of lobectomy, three of bilobectomy, and 16 of pneumonectomy.

In the 21 cases in which a conservative resection (lobectomy) or less could be performed, there was one death despite the wasting and general debility of the patient when admitted for treatment. In the remaining 20 cases the results were good and are regarded as asymptomatic cures. In construst, of the 16 cases in which total pneumonectomy was performed, in only seven was a good result obtained, and in three of these It was delayed considerably by complications. There were six deaths attributable to operation and three late deaths resulting from brain abscess.

The authors believe that if the problem of acute lung abscess is considered as surgical from the outset and the optimal time for intervention is recognized and acted on with dispatch, the problem of chronic lung abscess will virtually be eliminated. Until such a time pulmonary resection is the treatment of choice for suppuration of long atanding. Brouchographic follow-up of patients treated by open drainage will reveal that a significant number are left with residual parenchymal and bronchiectatic changes, which in all probability will lead to further symptoms at some future date. This is especially true when abscesses are drained in the chronic state or after secondary changes have taken place. For this reason pulmonary resection should take preference over open drainage in most cases seen by the surgeon at the present time.

(Glover, R. P., Rochester, Minn. and Clagett, O. T.: Surgery, Gynacology and Obstetrics, 88, 385-394, April 1948).

Reviews

HUMAN HISTOLOGY: A GUIDE FOR MEDICAL STUDENTS.—By E. R. A. Cooper, M.D. Second Edition. 1948. H. K. Lewis and Company, Limited, London. Pp. xii plus 431, with 257 illustrations including 4 coloured plates. Price, 27s. 6d.

This is a handbook which provides histological descriptions set out in the form of instruction course. After preliminary considerations of microscopy, cell and cell-division and different tissues the subject is presented system by system. Representative sections of histological material are described mainly from anatomical standpoint. They are arranged according to the course given at the University of Manchester. The practical details are designed to guide the student as he examines his sections. The text is amply supplemented by illustrations most of which are of human material and are actual photographs of laboratory specimens. The book will prove useful as a guide to medical students studying normal histology.

R. N. C.

O'MEARA'S MEDICAL GUIDE FOR INDIA AND THE TROPICS.—By H. W. Williamson, O.B.E., M.R.C.P., F.R.C.S.Ed., Lt.-Col., I.M.S. Fifth Edition. 1947. Butterworth and Company (Publishers), Limited, London. Pp. viii plus 882 and 48 index pages. Illustrated. Price, Rs. 28-4-0

O'Meara's book has been a guide to many practitioners in India since 1920 when it was first published. It has now been revised by Colonel Williamson, and

the revision had to be considerable in view of the great advances that have occurred in medicine since the previous edition was issued. It gives the essential details of treatment of common diseases and accidents, but the attractive feature of the book is the variety of information, covering as it does such subjects as electrical treatment, hydrotherapy, laboratory methods, massage, nursing, health resorts in India, sanitary inspecmassage, nursing, health resorts in India, sanitary inspections, D.D.T., diets and a host of allied subjects of daily importance to practitioners. There are special sections written by experts. In a few instances we noticed an uneven allotment of space. For instance, 'anæmias' gets barely two pages while 13 pages have been devoted to 'rabies and its prevention'. The table of 'offences affecting the public health' (p. 538), though of interest from the public point of view, is not of sufficient importance to doctors to justify ten pages. of sufficient importance to doctors to justify ten pages. But this is a minor matter. The book has been thoroughly revised and modern knowledge on a variety of subjects presented concisely. We are confident it will continue to be helpful as in the past.

R. N. C.

OPERATIVE GYNÆCOLOGY.—By H. S. Crossen, M.D., and R. J. Crossen, M.D. Sixth Edition. 1842. The C. V. Mosby Company, St. Louis. Pp. xviii plus 999, with 334 illustrations including 30 in colour

This is an elaborate work on the principles and practice of modern operative gynecology. There are 24 chapters in all. The chapters have been divided not on 'regional' basis but on 'topical' basis. For example, the first chapter is on 'Myoma of the uterus', the second on 'Cancer of the uterus', the fourth is on 'Pelvic inflammation' while the fifth is on 'Ovarian and parovarian tumours'. In doing so, the author has deviated from the orthodox set-up of a book on operative surgery, but with sufficient benefit for the reader, who can get all information he needs in the way the cases usually crop up in his purview. The minutest details have been given. The reading is pleasant, the style is easy and convincing.

In addition to the usual details of pre- and postoperative care, some very practical information has been incorporated in chapters XVIII and XXIV. An expert surgeon is often faced with the question—'Is operation indicated?' Most of us are competent to answer this from our experience. But the author is also there to benefit the reader by his experience.

With the ever-increasing field of gynæcological surgery we are perhaps trespassing into the domain of the general surgery. Chapter XVII dealing with the 'Intestinal tract in relation to gynæcologic surgery' is intended to be a surgery of the control of the cont intended to help the gynæcologist to secure justifiable entry into a field where so long he has been trespassing.

There are many self-explanatory and good illustrations. We have nothing but praise for the book. It will make a very useful addition to the library of anyone who has to do gynæcological surgery in all or any one of its branches.

M. N. S.

VADE MECUM OF MEDICAL TREATMENT .-- By W. Gordon Sears, M.D. (Lond.), M.R.C.P. (Lond.). Fifth Edition. 1947. Edward Arnold and Company, London. Pp. vil plus 407. Price, 10s. 6d.

APPEARANCE of five editions and a reprint within ten years speak for popularity of this vade mecum. It contains concise accounts of the treatment of medical conditions which are arranged alphabetically for ready reference. Sections on Addison's disease, gonorrhœa and purpura have been re-written in the present edition. The appendix has been enlarged; it contains an account of sulphonamides and penicillin, a posological table, lists of weights and measures, etc. Tropical diseases appear to have been rather neglected, for instance cholera, leishmaniasis and plague have not been

included; the obsolete long course of quinine has been recommended for treatment of malaria with no reference to newer synthetic antimalarials. Nevertheless the book provides in convenient form and handy size an account of the treatment of the more common conditions and can be recommended to all who need this type of work.

R. N. C.

MEDICAL TREATMENT IN GENERAL PRACTICE WITH RECENT ADVANCES .- By D. R. Dhar, M.B., D.T.M. (Cal.), M.R.C.P. (Lond.). Second Enlarged Edition. 1948. Published by Monica Dhar, 34, Satish Mukherjee Road, P. O. Kalighat, Caloutta. Pp. xv plus 701. Price, Indian:—Rs. 20; Pp. xv plus 701. Price, Indian:—Rs. 20; Foreign:—32s. 6d. (Available from D. M. Library, 42, Cornwallis Street, Calcutta)

In this edition the author has added many new chapters and thoroughly revised the others embodying the advances in medicine that have occurred since the book was first published ten years ago. Various circumstances prevented earlier issue of this edition. The book gives detailed treatment of diseases met with in general practice, and to help practitioners a brief account of clinical features and diagnosis have been added to each section. One feature of the book is that more attention has been paid to diet than is usually given in books of this type, keeping in view the special requirements of Indian patients. The book should be generally useful to practitioners, but we consider that some obsolete or doubtful forms of treatment might have been omitted without any harm to the value of the book, e.g. injections of T.C.C.O. or iodine in kala-azar and calomel cream in syphilis.

DISEASES OF THE CHEST .- By Robert Coope, M.D., B.Sc., F.R.C.P. Second Edition. 1948. E. and 6. Livingstone, Limited, Edinburgh. Pp. xv plus B41. Illustrated. Price, 25s.; postage, 9d. (home)

First published in 1944 this book was reprinted twice. The main change in this new edition is the correction of certain errors in the description of the anatomy of the bronchial tree. The earlier chapters deal with anatomical and physiological considerations as well as general clinical principles while the later sections deal with various diseases. The descriptions are clear and the standard is high. There are many excellent diagrams including some histological plates in colour hesides are appendix of illustrative chicagange. in colour besides an appendix of illustrative skiagrams. A few important points seem to have been missed especially with regard to modern treatment of tropical eosinophilia, tularæmia and plague; we hope they will receive due attention in the next edition. On the whole, the book is practical and contains all essential informations about diseases of the chest. It is well written and well produced.

MANAGEMENT OF COMMON CARDIAC CONDI-TIONS.—Edited by W. G. Leaman, Jr., M.D., F.A.C.P. 1946. J. B. Lippincott Company, Philadelphia and London. Pp. vili plus 306. Illustrated. Price, 24s.

In this book Dr. Leaman and twenty-three eminent contributors have dealt with the types of heart disease contributors have dealt with the types of heart disease commonly encountered by the general practitioner and have provided the recent advances in their diagnosis and treatment. The style of the book is easy and it can be read rapidly. The volume is illustrated by a number of diagrams which illustrate the text well, and each chapter ends with a list of references. There is a review of surgery of the heart and a chapter on psychosomatic aspects of cardiovascular disease, but the one on primary sarcoma of the pulmonary artery, an extremely rare condition, might have been left out considering what the title of the book implies.

R. N. C.

R. N. C.

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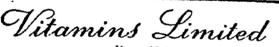
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Fig. 1

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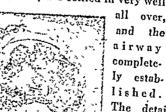
skin graft, prevent the raw surfaces adhering, and provide a good airway. A forehead flap conveyed by a curved left temporal artery flap was raised, and dermatome grafts were placed over the stent moulds to join the nasal linings, before the flaps were sutured into position. A dressing of Jelonet was applied with Elastoplast fixation.

August 26th, '44. Forehead flap severed. November 30th, '44. Bone graft to nose.

June 7th, '45. Creases and scars excised. Left airway established.

September 13th, '45. Width of base of nose reduced. Fleshy straightened.

June 27th, '46. Examination showed the flaps to have settled in very well



lished.



Fig. 3

The details and illustrations above are of an actual case. T. J. Smith & Nephew Ltd., of Hull, England, manufacturers of Elastoplast and Jelonet, publish this instance—typical of in which their prodmany, ucts have been used with success.

Fig. 2



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MEDICAL ANNUAL, 1948. Rs. 18-8-0

MEDICAL ANNUAL, 1947 (small stock) Rs. 12-0-0

MEDICAL ANNUAL, 1946 (small stock) Rs. 10-0-0

Forthcoming Publication

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Thacker, Spink & Co. (1933), Ltd. P. O. Box 54, CALCUTTA

A TREATISE ON HYGIENE AND PUBLIC HEALTH:
WITH SPECIAL REFERENCE TO THE TROPICS.—
By Birendra Nath Ghosh. Tweifth Edition. 1948.
Soientific Publishing Company, Calcutta. Pp. xvi
plus 764. Illustrated. Price, Rs. 15. Foreign (in
Indian currency) 22s. 6d. (in sterling)

This book deals with the subject with special reference to the tropics and with India in particular. Although the last edition appeared in 1945, the changes in the present edition are extensive, involving deletion of certain portions and incorporation of new materials almost in every chapter. The latter include recommendations of the Bhore Committee, reference to pre-erythrocytic forms of malarial parasites and newer synthetic antimalarial drugs, etc. There is also a special section on dietetic diseases by Megaw as well as another on leprosy by Cochraine. This edition like the previous editions should be very useful to medical men and public health administrators in India. The book is well printed and bound and the price is moderate.

R. N. C.

NURSING PATHOLOGY.—By Raymond H. Goodale, B.S., M.D. 1948. Published by W. B. Saunders Co., Ltd., London and Philadelphia. Pp. xiii plus 416. Illustrated. Price, 15s.

Dr. Goddle's book on Nursing Pathology will be welcomed by the medical students as well as by the nurses. The aim of the book, as the author puts it, is to 'Classify Pathological Processes and to correlate them with clinical entities'. This the author has achieved admirably by drawing upon the results of numerous advances made in medicine in the past three decades. The book is divided into three parts or 'Units', 'General Pathology, Applied Pathology, and Clinical Pathology'.

The first section explains the disease processes and principles underlined therein. Thus it serves as a foundation necessary to the proper understanding of applied pathology. In the section dealing with applied pathology the diseases peculiar to different organs of the human are discussed in the light of the principles and processes described in the first part. The second part covers a wide range of diseases grouped under ten heads corresponding to the different system of human organ. In addition, a special section deals with the more important communicable diseases. The third part on clinical pathology also brings into the picture the rôle of the nurse in relation to the collection and preparation of specimens for laboratory examination. Accurate diagnosis of the diseases depends much on such examinations and responsibilities of the nurse in this connection are described in detail. The methods of examination of blood, urine, sputum, etc., are also described in this part. Although the nurse may not be directly interested in the methods of examination, yet a knowledge of them would give her scientific background in the proper discharge of her responsibilities. Thus the special value of the book lies in its judicious combination of theory and practice. A glossary of important medical terms given at the end of the book also adds to its value.

B. P.

AIDS TO GYNÆCOLOGICAL NURSING.—By Hilda M. Grotlon, S.R.N., S.C.M., D.N. Fourth Edition. 1947. Baillière, Tindail and Cox, London. Pp. xii plus 196. [86 illustrations. Price, 5s.

In this little book the art of gynæcological nursing is set on the background of a scientific knowledge of the subject. Though brief the latter gives the essentials for a proper understanding of the requirements of the patient which is so necessary for good nursing particularly in the case of female patients. The first three chapters describe in outline normal conditions and processes, ovulation, fertilization, menstruation and

labour. Disorders and deviations from the normal are next dealt with and the practical art of nursing in gynwcological cases is set out in detail. The subjectmatter of nursing is developed in this book as a logical process in gynwcological treatment, and this is what makes the book valuable to the nurse in training. The book is one of the Nurses' Aids Series which has become popular and proved its usefulness to nurses in Great Britain. It is well illustrated to make the subject interesting and intelligible to the young nurse.

R P.

OPHTNALMIC NURSING.—By Maurice H. Whiting, O.B.E., M.A., M.B., B.Ch. (Cantab.), F.R.C.S. Fifth Edition. 1948. J. and A. Churchill Limited, London. Pp. x plus 138. Illustrated. Price, 7s. 8d.

This book is an outline in ophthalmic nursing based on experience at Moorfields Eye Hospital. The author has also drawn upon his valuable experience in the war. Ophthalmic nursing is a special art demanding special training. That is why good ophthalmic nurses are very rare in India. Although practice alone can teach how to nurse such a delicate organ as the eye, yet guides to this practice are indispensable and render valuable help to the nurse. In this respect the book under review plays an important part in ophthalmic nursing. The first few chapters of the book rightly give an outline of the theoretical background which makes a good introduction to the subject proper, namely, nursing. Within the 130 odd pages the author has presented his subject in an admirably concise manner but omitting no essentials. The nurse under training will find in this book a lucid exposition of a very difficult subject.

B. P.

NURSING IN DISEASES OF THE EYE, EAR AND THROAT.—By Manhattan Eye, Ear and Throat Hospital. Eighth Edition. 1948. W. P. Saunders Company, Philadelphia and London. Pp. xy plus 309. Illustrated. Price, 15s.

The value of this book in the treatment of diseases of the Eye, Ear, Nose and Throat may be judged from the fact that it is written by specialists of the Manhattan Eye, Ear and Throat Hospital, New York City. The book is essentially a practical guide to nursing in diseases of the eye, car, nose and throat, but at the same time it describes briefly the nature of the disease so as to give incentive to the nurse's intelligent handling of her patient. The book is well illustrated and has a glossary of the more common terms used in ophthalmology and otorhino-laryngology. In the eighth edition of the book the text has been revised and expanded throughout and new materials have been added to it. Special emphasis on nursing care and preventive aspects of various diseases make this edition particularly valuable.

B. P.

NURSING IN TUBERCULOSIS.—By Louise Lincoln Cardy, R.N. First Edition. 1948. W. B. Saunders Company, Limited, London and Philadelphia. Pp. xvi plus 481. Illustrated. Price, 20s.

Tuberculosis is fast becoming recognized in India as a public health problem of the first order. But very few in this country yet recognize that tuberculosis nursing is a speciality. Tuberculosis gives rise to such highly diverse situations that the mechanical application of the general principles of nursing may not meet all the requirements of tuberculosis cases. That is why this textbook is of special value to nursing in tuberculosis. The author herself has done pioneering work in tuberculosis nursing and the book she has produced from her experience and accumulated knowledge is indeed a most valuable contribution to the art of nursing. It combines technical knowledge and its

practical application with human understanding which is so essential in the treatment of tuberculosis. Special stress is laid on the part the nurse plays in the rehabilitation of the patient and the family which, according to the author, is 'the ultimate goal in tuberculosis'. The book is remarkable in that it sets a new and high standard for the pursing profession. It a new and high standard for the nursing profession. It raises the status of the public health nurse to that of' a specialized supervisor in the tuberculosis hospital. It is at the same time a valuable textbook for the student nurse. One noteworthy feature of the book is that at the end of every chapter there are review questions to test the knowledge of the student.

PSYCHIATRIC CASE-TAKING CARDS.—By Dr. A. Spencer Paterson. Size $\mathbf{B}_2^{1\prime\prime} \times \mathbf{4}_2^{1\prime\prime}$. Second Edition. 1948. H. K. Lewis and Company, Limited, London, W.C.1. Price, 9d, net

A SECOND edition has just been issued of these popular cards which were first published in 1943. They are pocket size and sold in a transparent envelope. One side gives the questions asked at the first interview to establish a provisional diagnosis. The other side gives questions put to a case of psychoneurosis to elicit causal factors in the history.

They will be found useful not only by psychiatrists but by all medical men and women who encounter psychiatric cases in their practice from time to time.

THE OBJECTIVE METHOD OF DREAM INTER-PRETATION.—By Major Satya Nand, M.B., B.S., I.M.S. 1047. Published by the author from Medical College, Amritsar. Pp. xv plus 251 plus 4. Available at Kitabistan, Alianabad

This is a study of dreams-their structure and functions. Analysis of dreams yields highly interesting details of the dreamer's subconscious mind, but it is not an easy job. The author describes in this book a method of interpreting dreams—method of reminiscence in which the subject of analysis is encouraged to concentrate as fully as he can on one topic, idea or event, and then let the mind work on it in alternate phases of stimulation and relaxation. In this method the interpretation of a dream is carried out in two separate stages: (1) dream analysis and (2) dream reconception. The technique is illustrated by the interpretations of two sample dreams which occupy a good part of the book. The author refers to the divergent views of different schools on dream analysis and criticizes their methods as not being exhaustive, as they leave out of consideration those parts of the dream which they feel are not convenient. His own views are interesting, but reading of the book is rendered somewhat difficult by frequent misprints and errors of punctuation.

'SOIL EROSION: ITS PREVENTION AND CON-TROL'.-Chief Editor L. Venkatakrishnan. Published by the Government of Madras, Government Press, Madras. Pp. xii plus 184. Illustrated. Price, Rs. 6

This attractive and well-written book has been compiled by an editorial committee of experts whose names have not been mentioned. The chief editor is L. Venkatakrishnan, the distinguished engineer, who has designed and built many irrigation and river training works in the Madras P.W.D.

The subject has been dealt with from various angles —irrigation, agricultural economy, forestry and health; and the book contains a wealth of information pertaining to India and plenty of technical data. The engineering aspects of soil erosion and soil conservation have been emphasized and dealt with more exhaustively than the rest. Some of the control measures can be put into effect only by Governments, as they are beyond the technical and financial resources of the average farmer with a small holding.

The book contains a chapter on Erosion and Malaria' which tries to cover the entire field of anti-malarial engineering in a short compass. In this connection, one wonders whether the instruction contained in the note under figure 63, page 56, 'The borrow pits should all be marked on the upstream side of the (contour) bund and never on the rear side (or downstream side) has been made with due regard to stream side) has been made with due regard to malaria control. Such a pit is likely to hold water for a longer period than necessary, and may promote malaria in the foothills, whereas if the borrow pit is formed by scraping the sidelong ground on the downstream side, it will not hold water, will not produce malaria and this will not weaken the bund appreciably.

BOOKS RECEIVED

1. Popular Science: A monthly journal. Edited by Perry Githens. Published by Godfrey Hammond of the Popular Science Publishing Company, Inc., at 353 Fourth Avenue, New York 10, N.Y.

2. World Health Organization: Progress and Plaus. Published by the Department of State, United States of America. Printed at the U.S. Government Printing Office. 1948.

3. Nagpur Medical College Journal. Volume I, No. 1, April 1948. Edited by V. P. Mishra. Published by Mr. S. K. Chaturvedi, B.Sc., at the Medical College, Nagpur, C.P.

4. Chikitsa-Jagat. Volume XIX, No. 10, August 1948. A monthly medical journal. Written in Bengali. Edited and published by Dr. Amulyadhan Mukharji from 27/C, Upper Circular Road, Calcutta.

5. Annual Report of the Chemical Examiner to Government, United Provinces, for the year ending December 1946. Printed at Allahabad by the Superintendent, Printing and Stationery, United Provinces, India. Price, 5 annas.

6. The Vegetarian News. Volume XXVII, No. 260. Summer, 1948. Mahatma Gandhi Memorial Number. A quarterly journal. Published by The London Vegetarian Society, 9, Adam Street, Adelphi, W.C.2.

7. Journal of the Gujarat Research Society. Volume X, No. 3, July 1948. A quarterly journal Published in September 1948, by The Honorary General Secretary, Gujarat Research Society, 46-48, Esplanade Mansion, Mahatma Gandhi Road, Bombay 1.
8. Chikitsa-Jagat. Volume XIX, No. 11, September 1948. Edited by Dr. A. D. Mukharji. Published by Dr. Amulyadhan Mukharji from 27/C, Upper Circular Road, Calcutta

Road, Calcutta.

9. Chikitsa-Jagat. Volume XIX, No. 12, October 1948. Edited and published by Dr. Amulyadhan Mukharji from 27/C, Upper Circular Road, Calcutta.

Abstracts from Reports

ANNUAL REPORT OF THE INDIAN COUNCIL OF THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION, NEW DELHI, FOR THE YEAR 1947

Report of the Chairman

THE All-India Leprosy Workers' Conference, held during the year at Wardha, was the first of its kind in India, and it could be said to mark the initiation of a new and a brighter chapter of anti-leprosy work in India. in India.

RESEARCH ACTIVITIES

A summary of the work done is given below :-

Therapeutic studies.—A study has been made of the value of the new sulphone drugs, promin, diasone and sulphetrone, in the treatment of leprosy. These drugs have been found of use in the treatment of lepromatous cases of leprosy. They are specially indicated in cases suffering from ulcers and eye complications, and in cases who cannot stand injections of hydnocarpus oil. The drugs mark a significant advance in the treatment of lepromatous leprosy, although their action is slow, and there are other limitations. This method of treatment is therefore not the last word in the treatment of leprosy, but marks an advance in the right direction.

Clinical studies.—A study has been completed of the eye lesions in leprosy and useful data have been collected.

The long-term study of selected cases of leprosy has been continued with a view to correlating the histological, immunological and bacteriological findings with the clinical progress of the disease in these cases. A large number of cases have now been under observation for a considerable period, and in these cases repeated bacteriological, immunological, histological and clinical examinations have been made. The study is yielding interesting and useful results.

Bacteriological studies.—Attempts have been made to repeat Dr. Row's work regarding the cultivation of leprosy bacillus in symbiosis with leishmania culture. However, no evidence of growth of the leprosy bacilli has been obtained, and the report of Dr. Row has therefore not been confirmed.

Immunological studies.—A review of the lepromin test has been written by Dr. Dharmendra embodying the results of his work on the subject which has resulted in great improvement in the test and has thrown considerable light on the mechanism of the reaction. The review has been well received and is considered to remain an authentic reference on the subject for some time to come.

A leprosy worker from Nigeria (Dr. Davey) recently reported that in the case of lepromatous patches, the lepromin test gave divergent results in the patch and the skin outside it, being positive inside and negative outside the patch. The matter has been investigated, and the results do not confirm Dr. Davey's report; the test usually produces negative results both inside and outside the patch.

Cockroaches and transmission of leprosy.—A leprosy worker from Rhodesia, Africa (Dr. Moiser), has suggested that cockroaches are responsible for the transmission of leprosy, and has produced certain evidence in support of his hypothesis. The matter has been investigated and the results do not lend support to the hypothesis of Dr. Moiser. Acid-fast bacilli have been found equally frequently in the roaches collected from a leprosy hospital in Calcutta, and from Delhi, about 1,000 miles away and with very little leprosy. Moreover, it has been possible to cultivate these acid-fast bacilli with great case from the antiformin treated gut-contents of the roaches. Both these facts strongly suggest that the acid-fast bacilli found in the guts of the roaches are not leprosy bacilli.

TEACHING

The Annual Leprosy Training Course was proposed to be held in Calcutta in the month of September 1947, but had to be dropped because of smaller number of applicants on account of the uncertain conditions then prevailing in Calcutta.

As usual a course of 8 lecture-demonstrations was given to the D.T.M. and L.T.M: classes of the School of Tropical Medicine, Calcutta.

GOVERNING BODY

Following on the constitutional changes in the country during the year, the Chairman and several members

have retired and left the country. In the vacancies thus caused His Excellency the Governor-General of India, President of the Association, has nominated Dr. Jivraj N. Mehta, Director-General of Health Services and Secretary to the Ministry of Health, Government of India, to be the Chairman.

PUBLICATIONS AND PROPAGANDA

The propaganda material published by the Association is stocked at, and issued from the Red Cross Depôt through the courtesy of the Indian Red Cross Society.

Plans are in progress for the production of a new propaganda film on Leprosy by the New Theatres, Ltd., Calcutta.

The quarterly journal Leprosy in India continues to serve a useful purpose,

The Leprosy Review, published quarterly by the British Empire Leprosy Relief Association Head-quarters in London, also continued to be sirculated in this country through the Indian Council.

A number of useful articles dealing with various aspects of leprosy has been published by Dr. Dharmendra and his colleagues at the Leprosy Research Department. School of Tropical Medicine, Calcutta.

PROVINCIAL ACTIVITIES

The reports of the Provincial Branches indicate that steady progress is being made in the various provinces. The various activities, such as treatment of cases of leprosy, propaganda, teaching in medical institutions, surveys, etc., have been continued. Clinical and epidemiological studies in Madras have also been continued; the details of these studies will be found in the report of the Madras Provincial Branch. It is gratifying to note that the important question of isolation of infective cases of leprosy is receiving increasing attention.

FINANCE

The accounts show that the financial position of the Association continues to be satisfactory. As in previous years, more than half the income was distributed to the Provincial Branches for expenditure on local activities, whilst the amount retained at headquarters was spent on objects which benefit the country as a whole.

R. N. C.

NINTH ANNUAL REPORT OF THE TUBER-CULOSIS ASSOCIATION OF INDIA FOR THE YEAR 1947. PUBLISHED BY THE TUBER-CULOSIS ASSOCIATION OF INDIA, NEW DELHI

The activities of the Tuberculosis Association of India during 1947 were inevitably influenced by the various developments in the country. The unspeakable strain attendant on large-scale migration of people who had literally lost everything, their concentration in camps, and their agony and privations have created fresh conditions favourable to the spread of tuberculosis. The dislocation of communications increased the difficulties of the Association in carrying out its normal duties.

The partition of India and the formation of the new Dominions also left their mark on the activities of the Tuberculosis Association of India. Four of the affiliates, viz, the Associations at Karachi, Quetta, Peshawar and Lahore, are within the Pakistan Dominion. Of these the Lahore Association was dissolved on the 14th August, 1947, with a view to the formation of a new Association in each of the East and West Punjab provinces. An Association has lately been formed in East Punjab.

It was not possible to hold a Post-Graduate Refresher Course during the year and the annual Health Visitor's class too had to be postponed to January of this year. Nevertheless, the Associations had carried on its normal activities, albeit on a 'Maintenance basis' only, and kept the tuberculosis problem before the public and the Government. The Lady Linlithgow Sanatorium at Kasauli, and the Model Tuberculosis Clinic in New Delhi, in spite of the difficulties during the last few months of the year, have taken their shaws in the training of doctors and health visitors in addition to their usual—functions.

The arrangement with the Union Mission Sanatorium at Madanapalle, by which Dr. P. V. Benjamin was allowed to advise the Tuberculosis Association of India on technical matters, continued during the year. The Association is grateful to Dr. Benjamin for devoting his time to the work of the Association in addition to his usual heavy duties.

The propaganda activities of the Association continued during the year on the same lines as in the previous year.

The Tuberculosis Association of India received in the course of the year a sum of Rs. 50,000 from out of the available balances of Lady Linlithgow's Silver Trinket Fund, and also a sum of Rs. 5,000 from the Women's Volunteer Services. The total sum donated by the R.K.O. Radio Pictures, Limited, Bombay, now amounts to Rs. 25,240-8-0 including the sum of Rs. 32-10-0 credited to our account in 1947. The Tuberculosis Association of India is grateful to these kind donors for their generosity.

The sum of Rs. 10 lakhs granted to the Association by the Viceroy's War Purposes Fund is available for assisting ex-service personnel suffering from tuberculosis. The money is to be used for the treatment of exservicemen in hospitals or sanatoria approved by the Tuberculosis Association of India.

During the year under report there has been a slight increase in the number of tuberculosis institutions in the country. Five more clinics have been started in Orissa, while the bed-strength of the Madar Union Sanatorium in Ajmer has been increased from 52 to 125. In Madras a clinic and two sanatoria have been recently opened and the Government has converted the Wellesley Sanatorium Jail into a Government Sanatorium with 200 beds, thus increasing the number of beds for tuberculous patients in the province from 1,236 to 1,454. In Bengal one clinic has started functioning in Burdwan. Schemes for increasing the number of tuberculosis institutions in provinces and states are reported to be receiving attention.

The number of tuberculosis clinics in India (including Pakistan) is 134. There are 76 tuberculosis hospitals and sanatoria with a bed-strength of 5,144. In addition there are 2,064 beds for tuberculous patients in general and isolation hospitals and 584 beds for use of tuberculous convicts. The Army Headquarters maintain 1,200 beds for tuberculous soldiers, but this number, it is understood, is likely to be reduced in coming years.

R. N. C.

.Correspondence

GLUCOSE INJECTION

Sr,—I am sure you have heard about the dangerous febrile reactions and subsequent collapses that occasionally occur by the use of intravenous injections of glucose solutions made by even the best known firms of India. I cannot single out any particular manufacturer, because I have used all the well-known brands available in the Calcutta market and found all of them at fault on occasions.

Febrile reactions up to 106°F. or 107°F. have been seen by me followed by an almost complete collapse with profuse sweating, etc., which has had to be combated with stimulants by mouth and injections.

Such events bring great discredit to the attending doctor and make the patients stay off further injections. They fail to understand that the fault is not the doctor's but of the medicine used, as they think that the doctor should not have used such dangerous drugs.

Are the reactions due to pyrogen in the distilled water used or is the glucose powder from which the solution is made at fault? Why does not every injection bring such a reaction but only one occasionally?

I do not remember to have had a single case of such reactions occurring with glucose solutions made in Germany or by British chemists, which to my great regret are not available nowadays.

The matter is of grave importance to the practising doctor, who may be some day sued in a court of law for damages if a patient dies of such injections. I request you, please, to ventilate this matter among the practising medical men and use your paper's prestige and authority to bring to the notice of the Government the dangers that follow permitting manufacturers to sell contaminated drugs, particularly injection ampoules.

Yours faithfully, .
A. SEN, M.B.

NAIHATI, 13th September, 1948.

HIGHER MEDICAL QUALIFICATIONS, AT HOME

Sm.—As it is high time that Free India gave facilities to all of us to obtain higher qualifications at home instead of at abroad, I hope your paper will espouse this cause.

I object neither to the Government sending out scholars to learn to subsequently improve our institutions nor to individuals proceeding abroad on their own. What is desirable is that Foreign degrees by themselves should not become an asset in practice as is the position to-day. I can see neither sense in having a host of degrees nor the practical difference between the M.S. and F.R.C.S.

I personally favour the introduction of a single degree of M.D. in India instead of M.B.B.S., M.S. and M.D. which are obtainable to-day. Those having contributed substantially to the progress of medicine could then be elected a Fellow of Indian College of Physicians and Surgeons (F.I.C.P.S.).

It is painful to read the names of a few Indians amongst a list of Europeans in the published results of these higher examinations held in England. Still more painful it is to feel that only filthy lucre stands between an able and aspiring graduate and these coveted degrees.

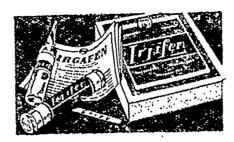
Yours, etc., 'GRADUATE'.

[We agree. Higher qualifications should be available in India.

Further, lower qualifications than the degrees should remain available and the higher qualifications should also be within the reach of those starting their course on lower qualifications.

Furthermore, post-graduate institutions, other than those granting diplomas in special subjects, should be founded. In these institutions medical practicioners mostly interested in medical practice will receive information on recent advances in various subjects from specialists in those subjects. They will choose their own subjects and will visit the institution whenever they feel the need. It is the lack of this information





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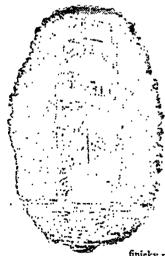
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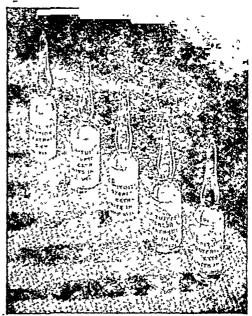
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which turns the majority of medical practitioners into job hunters. They do not feel confident to give the patient the appropriate treatment or advice. The patient the appropriate treatment or advice. The patient senses this diffidence and turns his back on the M.B.'s, L.M.S.'s, L.M.P.'s and the rest to seek aid from others whom the M.B.'s, L.M.S.'s, L.M.P.'s and the test seek to eliminate by the aid of legislation. The fault lies with the M.B.'s, L.M.S.'s, L.M.P.'s and the rest. They know it and instead of giving medical relief to the weak, the ill-nourished, the sick and the dying, by means based on untodate information in medicine. by means based on up-to-date information in medicine. surgery, nutrition and public health, they seek medical relief given to medical men by the security of posts. Such is and has been the situation in our country ever since the Western medicine came to us through the East India Company. It is about time we ended it and mended things.

Elsewhere in this issue there is an announcement concerning medical education: Views are solicited from educationists, critics, practitioners and others interested in the topic. Send them along if you are interested. Do not worry about the expression and the style. We will rectify minor flaws in them, if present. Send us the points.-Eprron, I.M.G.1

SELECTION OF MEDICAL TEACHERS

Sir,-In view of the importance of selection of proper medical teachers for our expanding medical teaching institutions it seems to me very necessary that we should have clear ideas about the attributes we desire in our teachers. Public service commissions with a majority of non-professional selectors are perhaps not the ideal bodies to recruit the best medical talent available, but accepting this method as a necessary evil for some time to come, the profession (i.e. the Indian Medical Association) should furnish certain guiding principles to help them. One such tentative scheme is suggested for discussion.

Total marks-100.

Qualifications 20 marks B. Professional experience C. Original contributions D. Special attributes 30 marks 25 marks 25 marks

A. Qualifications-20 marks.

(i) Pre-graduate professional evaluations-10 marks. Two marks each acr the first, second and third professionals and four marks for the final professional. Full marks for standing first. 50 per cent for the first 10 positions in an examination.

(ii) Post-graduate qualifications—10 marks. Full marks for an M.D., or M.S., or M.R.C.P., or F.R.C.S., etc., etc. Fifty per cent for less colourful 'tails'.

B. Professional experience-30 marks.

(i) Recognized house appointments-5 marks. Full marks for appointments of one year's duration or over.

(ii) Appointments in the speciality—10 marks. Full marks for appointments of five years' duration or over—two marks for each year.

(iii) Teaching experience-5 marks. Six months or over.

(iv) Foreign travel and professional experience-5 marks. Six months or over.

(v) Two references—5 marks. For an adverse report from a referee deduct 10 marks. For two adverse reports deduct 20 marks.

C. Original contributions-25 marks.

Five marks each for an original contribution published in a recognized journal. Full marks for even one outstanding contribution.

D. Special attributes-25 marks.

(i) Personality-5 marks. Including dress and personal hygiene.

(ii) Sports record-5 marks. College blue, etc., full marks.

(iii) Ability to lecture—15 marks. The candidate should be required to give a demonstration lecture on any selected subject for at least 15 minutes.

Yours, etc., P. N. CHHUTTANI.

LONDON, 11th September, 1918.

MEDICAL BOOKS

Sin,—There are a number of valuable old medical books, printed in various countries of Europe in the 18th and 19th centuries, lying unknown and unutilized in India and gradually disappearing or disintegrating.

The Government of India have recently approved of a scheme to search for salvage and examine the old medical books in various libraries in India with a view to preparing a special catalogue of these valuable books Circulars have been sent to all the medical colleges and other medical institutions in India, requesting lists of such old books for detailed examination. Some of the books will have to be photographed to show the title pages or illustrations. An analysis of the contents and the importance of the books as well as biographical notes of the author will have to be added.

Special attention has to be given to old medical books dealing with the health problems and diseases of India and neighbouring countries, and also to those books written by various medical men serving in India, either as East India Company's doctors or as surgeons attached to native States or private missions.

Some of these books have been printed in India and may not be available easily in Western countries and libraries. Their existence or contents are unknown and libraries. Their existence or contents are unknown to European and American teachers and writers on medicine. Even in India, all the books printed in India on discases of India in the 18th and 19th centuries are generally unknown to the Indian medical profession. When somebody knows about the existence of an old medical book, it is not available in certain parts of India. There is no list of such old books and whether they are available in India and if so where.

May I request your readers to pass on any information they have regarding the existence of old medical books, particularly those printed in India or manuscripts, in any mivate collection or in the private libraries of the medical practitioners of the last century. Many of the private libraries of the native States, zemindars, educated and cultured families missionery. zemindars, educated and cultured families, missionary establishments, various printing presses and publishing houses may have a few valuable old medical books, which may not be available in the public or medical college libraries. All lists of such books or the addresses of persons where such books are available or even the books themselves may be sent to the

Yours faithfully, D. V. SUBBA REDDY,

Officer on Special Duty of Re-organization of Medical Libraries in India, Madras.

LEPROSY SUFFERERS NEED 'NEW DEAL'

Sm.—The Government of West Bengal are going to implement the health plans of the Bhore Committee. As leprosy is a major health problem of this province, it will doubtless receive their due attention. A fort As leprosy is a major nearth problem of this province, it will doubtless receive their due attention. A few months ago the Government set up a Committee to plan a comprehensive leprosy scheme for this province. The plan has now been prepared and the Government will soon take decision on the proposals submitted

to them.
Calcutta has the distinction of being the pioneer category and the distinction of being the pioneer city in India for researches in leprosy. This work was started by Sir Leonard Rogers as early as 1916 and since then with the establishment of the Calcutta

School of Tropical Medicine considerable progress has been made and leprosy research has been placed on a permanent basis. It is however regretted that although leprosy has been recognized as the major endemic disease in West Bengal, yet it has not received the same administrative attention as it deserves.

In organizing an adequate leprosy campaign for the province it is essential that leprosy should be viewed as an ordinary organic disease and, except where special measures are necessary, be treated in the wards of general hospitals. In Madras, routine treatment of leprosy has been accepted by the Government as a legitimate function of the general medical service of

the presidency.

A further advance in the preliminary organization of a leprosy campaign in Madras was made by the Surgeon-General in making it incumbent upon all district hospitals to admit patients suffering from leprosy who require immediate medical or surgical treatment, either for diseases other than leprosy or for acute complications due to leprosy. These patients should, however, be admitted to the septic or infectious diseases words if conting or infective. diseases wards, if septic or infective.

It is now an agreed principle that a leprosy patient has as much right to receive treatment at a general hospital as has a person suffering from syphilis, tuber-culosis or cancer. Therefore treatment of leprosy should be available at all Government, municipal, district board and local fund dispensaries. There is no justification, apart from traditional prejudice, for withholding treatment.

One of the greatest handicaps in the development of a leprosy campaign is the lack of interest of the medical profession. While active measures are undertaken for the control of malaria, tuberculosis, plague and other infectious diseases, the approach to leprosy is elementary. In the medical curriculum, both undergraduate and post-graduate, the scientific aspect of leprosy is not sufficiently stressed. It is imperative that in every teaching hospital an adequately equipped that in every teaching hospital an adequately equipped and fully staffed department, with adequate facilities for lectures and demonstrations on the clinical and pathological aspects of the disease, should be provided.

Medical education is being reorganized at the moment and it will be a great tragedy if leprosy does not receive the attention it deserves.

With the advancement in knowledge of leprosy, there is no reason why the disease should not be brought under control within a measurable period of time. The under control within a measurable period of time. The use of sulphones—promin, diasone and sulphetrone—in the treatment of advanced cases has been found satisfactory in many instances. The prolonged use of these medicines in rather large doses has reduced swellings, cleared blemishes and caused ulcers to heal and even made some patients free of the causative germs. All these have been verified at the Calcutta School of Tropical Medicine. How far these beneficial results will be permanent, it is too early to say. Even so, it is a great landmark and opens a new era of so, it is a great landmark and opens a new era of research.

These latest additions to the therapeutic armoury of leprosy will not, however, solve the problem of treat-ment, because no curative remedy for leprosy can ever ment, because no curative remedy for leprosy can ever overcome the permanent damage and disability caused by the disease to such organs as eyes, nose, throat, voice box. or cure trophic ulcerations and muscular atrophy. Much damage, disability and suffering can, however, be prevented and reduced by application of electrotherapy, actinotherapy, physiotherapy, neurosurgery and orthopædy. Unfortunately, there is no leprosy institution in West Bengal where these modern facilities are available. The greatest handicap to their wider use is high cost. Here again, the Government should step in and do their utmost in enabling the average leprosy patient to procure the drug at a price suited to their meagre purse.

It should be realized that treatment, however much

It should be realized that treatment, however much efficient it may be, will not alone control the spread of the disease. Leprosy being a contact disease its prevention can be accomplished only by effectively isolating infective cases from contact with susceptible

persons as there are no means by which such persons can be rendered resistant to the disease.

Preventive measures must be based on the fact that the child, being the most susceptible to leprosy, is most liable to contract the disease from contact with an infective case. Adult leprosy per se receives a disproportionate share of attention in our leprosy campaigns, but the main importance of an adult infective case of leprosy, from the public health point of view, is the number of children within contact range of the patient.

If the infection of children could be stopped it is likely that leprosy would not survive long by adult infection alone. It is extremely unfortunate that the conscience and imagination of our nation have, as yet, not been aroused to the essential tragedy of this

needless infection of children.

Yours, etc., P. SEN.

Leprosy Officer, B. E. L. R. A. (West Bengal Branch)

Any Questions

INDIAN MEDICAL AND PUBLIC HEALTH JOURNALS

Sir,—I shall be grateful if you will inform me of the names of all the *Medical* and Public Health Journals that are published in India, preferably province-war.

SAKLASPUR

(HASSAN DT.),

4th October, 1948.

Yours truly, D. SHAMANNA,

Assistant Surgeon.

[LIST OF INDIAN MEDICAL AND PUBLIC HEALTH JOURNALS

Bombay:-1. Indian Journal of Medical Sciences.

- International Journal of Sexology.
 Indian Journal of Venereal Diseases
 Dermatology.
- Indian Physician.
 Medical Bulletin.
 Medical Digest.

Calcutta:

- Calcutta Medical Journal.
 Indian Journal of Medical Research.
 Indian Journal of Malariology.
 Indian Medical Gazette.
 Indian Medical Record.

- Leprosy in India. Journal of the Indian Medical Association.
- Science and Culture. Indian Journal of Pediatrics.
- Immunity Bulletin. 10.
- International Medical Abstracts and Reviews.

 Annals of Biochemistry and Experimental

 Medicine. 11. 12.
- Bengal Public Health Journal.
- Calcutta Medical Review. Indian Journal of Ophthalmology. 15.

Delhi :-

- 1. Indian Journal of Veterinary Science and Animal Husbandry.
- 2. Indian Journal of Entomology.

Madras :-

- Antiseptic.
- Indian Medical Journal. Indian Veterinary Journal. Indian Journal of Surgery.

Bangalore :-1. Proceedings of the Indian Academy of Science

Section A. 2. Proceedings of the Indian Academy of Science Section B.

3. Current Science.

Allahabad :-1. Journal of the Christian Medical Association of India, Burma and Ceylon.

Patna : 1. Paina Journal of Medicine.

Lahore: 1. Journal of the Association of Medical Women in

India.

2. Journal of Obstetrics and Gynmeological Society of Northern India.-Eprron, I.M.G.1

Service Notes

APPOINTMENTS AND TRANSFERS

DR. R. VISWANATHAN, Officer on Special Duty (Tuberculosis), on relief by Dr. P. V. Benjamin, is appointed temporarily as Assistant Director-General of Health Services (Resettlement), with effect from the

1st June, 1948.

Dr. M. N. Lahiri is appointed to the Medical Research Department on probation for 2 years with effect from the 2nd July, 1948.

Lieutenant-Colonel C. Mani, Additional Deputy Director-General of Health Services (Public Health) It. was placed on deputation to Geneva from the 15th June to the 1st August, 1948. Dr. R. K. Goyal, an Officer of the Medical Research

Department, is transferred to foreign service for 2 years for employment as Professor of Pathology, Medical College, Gwalior, with effect from the afternoon of the 20th September, 1948.

Women's Services in India INDIAN MEDICAL SERVICE (Emergency Commissions) To be Captains

SECONDED TO THE INDIAN ARMY MEDICAL CORPS (Mrs.) Tharmapuram Krishnasami Sundaram. Dated

30th May, 1943. (Miss) Vidyavati Saberwal. Dated 9th March, 1943. (Mrs.) Jean Robertson Biggar. Dated 20th April,

1943. (Miss) Violet Mary Nazareth. Dated 10th May, 1943.

(Miss) Perin Mullaferoze. Dated 27th May, 1943. (Miss) Alva Adeline Daniell. Dated 27th March,

1943. (Miss) Jacinth Muriel Goudoin. Dated 19th April.

(Mrs.) Janaki Abdul Karim. Dated 14th May, 1943. (Mrs.) Mathurabai Bhawanishankar Kagal. Dated 16th December, 1943.

(Miss) Annie Christine Pichaimuthu. Dated 24th July, 1944.

(Mrs.) Amy Winifred Burrowes. Dated 6th August, 1943.

(Miss) Berenice Criouleansky. Dated 26th January, 1943.

(Miss) Cochee Narayanaswamy Rukmini. Dated 8th

June. 1944.
(Miss) Winifred Agnes Vaz (now Mrs. Fernandez).
Dated 19th April, 1943.

Dated 17th (Mrs.) Rajrajeshwari Devi Karki Pahwa. Dated 17th

November, 1943. (Mrs.) Saralabai Atmaram Kulkarni, Dated 13th

November, 1943. (Miss) Shireen Ardeshir Lal. Dated 2nd January,

(Miss) Perin Ratushah Dibam. Dated 14th April, 1943.

(Mrs.) Isabel Hufiton. Dated 12th May, 1944. (Mrs.) Leela Thorat. Dated 15th December, 1944. (Miss) Khorshed Irani (now Mrs. Pasricha). Dated

20th May, 1943.

(Miss) Latif Begum Khan. Dated 20th March, 1943. (Miss) Shanta Jayawant. Dated 29th August, 1944. (Miss) Daisy Pereira. Dated 4th September, 1914. (Miss) Maude Elisbeth Khan. Dated 9th May, 1944. (Miss) Jaul Barjorji Hakim. Dated 11th March, 133

1943.

(Miss) Sillo Sorabji Daruvala. Dated 15th April, 1943.

(Miss) Mary Thomas. Dated 8th October, 1943. (Miss) Malati Mallannah Shrinagesh. Dated 11th June. 1943.

(Miss) Zubaida Hazi Yousof Sobani. Dated 20th

September, 1943.
(Miss) Achy Mathew. Dated 19th March, 1945.
(Mrs.) Greta Darretto (neé Neri). Dated 25th March, 1943.

(Miss) Lalithakrishna Rao. Dated 13th January,

1944. (Mrs.) Gladys Connor. Dated 1st August, 1942. (Miss) Mary Kozhimannil Verghese, Dated 2nd November, 1943.

(Miss) Nivedita Sen. Dated 15th June. 1943, (Miss) Lakshmiraju Suryakantham. Dated 31st

May, 1943. (Miss) Hannan Cohen. Dated 14th March, 1943. (Miss) Mavis Gomez. Dated 23rd March, 1943. (Mrs.) May Frances Huiton. Dated 19th July, 1913.

(Miss) Jasmine Enoch. Dated 21st June, 1943. (Miss) Mahalakshmi Subbarayalu Naidu. Dated 23rd

March, 1943.

(Miss) Mary Isaac Judah. Dated 18th December,

(Miss) Sarah Abraham Shellim. Dated 25th Septemher, 1943.

(Miss) Roshan Nusserwanjee Chinoy. Dated 17th

January, 1944.

(Miss) Amy Jungalwalla. Dated 2nd August, 1943.

(Miss) Harbans Kaur Garewal (now Mrs. Inderjit Singh). Dated 3rd July, 1943.

(Miss) Puthuzeril Puthenpurakal Elizabeth Kuriyan. Dated 5th September, 1944.

(Miss) Louise Mary Tellis. Dated 16th February. 1944.

(Miss) Chariotte Dequadros. Dated 12th March, 1943.

(Miss) Lucy Achamma Verghese (now Mrs. Kuruvilla). Dated 15th January, 1944.
(Miss) Leela Nihal Chand. Dated 29th March, 1943.

(Miss) Kamala Khanna (now Mrs. Bhandari).

Dated 14th February, 1943.
(Mrs.) Mangalore Sangannabai. Dated 1st January,

(Miss) Dina Langrana. Dated 9th August. 1943. (Miss) Kootalathodi Gopalapanikker Janaki (Miss) Kootalathodi Dated 4th July, 1943. Janakibai.

(Miss) Saradadevi Subbarao. Dated 8th December, 1943.

(Miss) Nargesh Murzban Kothawala (now Mrs. N. P. Mistree). Dated 8th June, 1943.
(Miss) Teresa Dominic. Dated 22nd April, 1944. (Miss) Dina Burjorji Lovii. Dated 9th August, 1943. (Miss) Anne Rocha. Dated 12th August, 1943. (Miss) Matilda Butt. Dated 18th June, 1943. (Miss) Betsy Christina Zachariah. Dated 21st July,

1944. (Miss) Muriel Marie D'Souza. Dated 13th Decem-

(Miss) Mary Hilda Juliet James (now Mrs. Leela Ramchandran). Dated 1st September, 1943. (Miss) Annamma Abraham. Dated 25th November,

(Miss) Simantini Balkriehna Kekre. Dated 7th February, 1944. (Miss) Freda Emilia Preitas. Dated 11th December,

(Miss) Lourda D'Cunha. Dated 17th January, 1944. (Miss) Chittur Subramanya Ananthalakshmy. Dated 15th May, 1945.

(Mrs.) C. K. Lal. Dated 8th August, 1942.

(Miss) D. F. MacBeen. Dated 15th September. 1945.

(Miss) L. C. Peterson (now Mrs. Hylton). Dated

10th June, 1943.
(Miss) D. W. Smith (now Mrs. Wells). Dated 23rd April, 1945.

(Miss) B. F. Thomas (now Mrs. Dickinson). Dated 17th October, 1942.
(Miss) D. Pacheco (now Mrs. D'Souza). Dated 3rd

November, 1942.

(Miss) P. D. Nanavatty. Dated 21st August, 1942.

(Mrs.) R. S. McGown. Dated 14th February, 1944.

(Miss) G. M. Higgins. Dated 25th November, 1942.

(Mrs.) G. C. W. Millington. Dated 8th August,

(Miss) B. M. Burgess (now Mrs. Thirlaway). Dated

24th August, 1942. (Mrs.) S. H. Montgomery. Dated 12th September, 1943.

(Miss) A. Dowds. Dated 15th January, 1944.

(Miss) L. Bhargava. Dated 21st July, 1942. (Mrs.) E. M. McDonald. Dated 5th August, 1942. (Miss) N. Rogers (now Mrs. Shubik). Dated 15th September, 1945.

(Miss) A. Mathew. Dated 24th September, 1942. (Miss) J. M. Thornton (now Mrs. Ferguson). Dated 8th August, 1943.

(Miss) L. M. Reeve (now Mrs. Burbidge). Dated

(Miss) L. M. Reeve (now Mrs. Burbinge). Dated 10th January, 1943. (Miss) B. Howarth. Dated 15th September, 1945. (Miss) C. M. Rogan. Dated 8th August, 1943. (Miss) H. K. N. Shastry. Dated 21st March, 1943. (Miss) L. James (now Mrs. L. M. Corall). Dated

27th April, 1943.

(Miss) K. P. Roe. Dated 15th June, 1943. (Miss) C. T. Howat (now Mrs. Gray). Dated 21st

September, 1944.
(Miss) K. Isaac (now Mrs. K. R. Khan). Dated 4th

July, 1943.

(Miss) M. A. C. MacHugh. Dated 10th August, 1942.

(Miss) L. M. D'Silva. Dated 16th July, 1943. (Miss) G. E. L. Cummins. Dated 16th October,

(Miss) M. S. Garden (now Mrs. Austin). Dated 16th October, 1943.

(Mrs.) B. N. Akeroyd. Dated 26th October, 1944. (Miss) P. L. F. Heaton (now Mrs. McKimmie).

Dated 18th August, 1943. (Miss) S. D. Chopra. Dated 16th September, 1943. (Miss) C. Beemer. Dated 18th September, 1943. (Miss) T. V. Sitalakshmi. Dated 21st September,

1943.

(Miss) I. B. Schooling. Dated 18th August, 1945. (Miss) K. N. C. Lal. Dated 2nd November, 1944. (Miss) S. L. Bhatia. Dated 18th December, 1943. (Miss) P. Vedam (now Mrs. Pathak). Dated 20th

December, 1943 (Miss) P. H. Baria (now Mrs. Hamidullah). Dated

24th December, 1943.
(Miss) E. S. Chaube (now Mrs. Maker). Dated 4th

January, 1944.

(Miss) S. I. Jacob. Dated 20th January, 1944. (Miss) D. J. Ball. Dated 1st June, 1944. (Miss) D. Balraj. Dated 9th February, 1944.

(Miss) Hamida Malik (now Mrs. K. Hamida Ahmed).

Dated 26th February, 1944. (Miss) D. E. Thomas. Dated 28th February, 1944. (Mrs.) G. E. Harland. Dated 13th January, 1945. (Miss) T. N. Irani. Dated 23rd March, 1944. (Miss) M. S. Shikh (now Mrs. H. M. Sultana).

Dated 24th March, 1944.

(Miss) N. D. Chadha (now Mrs. Khanna). Dated 4th April, 1944.

(Miss) S. Aziz. Dated 18th April, 1944. (Miss) R. A. Gulmohamed. Dated 20th April, 1944. (Miss) K. S. Javalakshmi. Dated 26th April, 1944.

(Miss) L. D. Karnick. Dated 29th April. 1944. (Miss) N. Manoharabai (now Mrs. Sushila Pujari). Dated 27th May, 1944.

(Miss) K. M. Blacklock (now Mrs. Elliott). Dated 26th October, 1944.

(Miss) Khurshi-un-Nissa Chaudri. Dated 30th July,

(Miss) S. M. Terway. Dated 11th August, 1944. (Miss) S. C. Thomas. Dated 11th September, 1944. (Miss) F. G. Danson (now Mrs. Carr). Dated 21st

(Miss) F. G. Danson (now Mrs. Carr). Dated 21st September, 1944.

(Miss) C. Sarojini. Dated 15th October, 1944.

(Miss) L. B. Bhaive. Dated 20th December, 1944.

(Miss) M. E. Lazarus.. Dated 21st December, 1944.

(Miss) N. K. Sunanna. Dated 5th January, 1946.

(Miss) A. George. Dated 6th January, 1945.

(Mrs.) B. J. Thorpe. Dated 15th January, 1946.

(Miss) E. M. Hugill (now Mrs. Pilvang). Dated

(Miss) E. M. Hugill (now Mrs. Pilvang). Dated 22nd July, 1945.

(Miss) J. N. Winstanley. Dated 22nd July, 1945.

(Miss) S. Mitra. Dated 18th April, 1945.

(Miss) U. Hargreaves. Dated 30th April, 1945.

(Mrs.) J. L. Kahan. Dated 14th May, 1945.

(Miss) M. Leahy. Dated 19th May, 1946.

(Miss) L. M. B. Copland. Dated 25th July, 1945.

(Miss) S. J. Mistry. Dated 19th August, 1945.

(Miss) G. S. Singh. Dated 15th October, 1945.

(Miss) Q. V. Norris. Dated 22nd October, 1945.

(Miss) E. V. Tobit. Dated 24th December, 1945.

(Miss) A. Kallat. Dated 23rd October, 1945.

(Miss) B. E. M. Judson (now Mrs. Bevan). Dated

(Miss) B. E. M. Judson (now Mrs. Bevan). Dated 11th January, 1946.

RETIREMENT

Lieutenant-Colonel D. P. Mitra. Dated 27th May, 1948.

RESIGNATION

Captain D. P. Lahiry, Medical Assistant (formerly designated Technical Officer), Central Research Institute, Kasauli, was permitted to resign his post with effect from the 14th August, 1948.

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Original Articles

AN ANALYSIS OF 50,000 SKIN CASES AS SEEN IN THE OUT-PATIENT DEPART-MENT OF THE SCHOOL OF TROPICAL MEDICINE, CALCUTTA, DURING THE FIVE YEARS FROM 1942 TO 1946

By L. M. GHOSH, M.B. (Cal.), D.T.M. (L'pool)

Head of the Department of Dermatology, School of

Tropical Medicine, Calcutta

So far as is known, there is no published record of a complete list of the incidence of skin diseases in India. For reference one has to take the help of the records of the various hospitals individually, and most of these records are incomplete, unpublished or not easily available.

Research workers and authors who wish to write books on skin diseases are confronted with difficulties for want of reliable statistics. Figures from books published in Western countries are often quoted. But those figures differ widely in many important points. For instance, psoriasis has been described by many prominent authors as a rarity in the tropics though the dermatologists in India do not hold this view. Again ringworm of the skin is a major dermatological problem in the tropics but it is of little importance in the colder countries. The pigment changes in the skin as in 'Leucoderma' (vitiligo) are not only common in India but are of great importance as a social problem; they, however, have little significance in the colder countries.

It is usually admitted that much confusion exists in the classification of skin diseases. To avoid this confusion and for ready reference, the names of the diseases have been put in the alphabetical order. Only three special groupings have been made, namely, (1) the granulomas of the skin, (2) fungus infections of the skin and (3) pigment changes in the skin. This grouping is likely to be of help in the study and classification of skin diseases in this country as these three groups cover almost all the important conditions commonly met with in the tropics.

Minor conditions commonly met with here such as abrasions, cuts, small burns, septic wounds, dog and rat bites have been omitted from this list as these are not usually counted as skin diseases.

In the out-patient department one has to depend mostly on clinical experience but as far as possible laboratory confirmation of the clinical diagnosis was done especially where such examination was a necessity. Where this was not done a note to that effect has been made.

This statistics deals with cases seen during the last five years, and the quinquennium happened to be the period of war and immediately after. There is bound to be some discrepancy in the incidence of some diseases during this period and the period of five years before the war. For instance, naga sore (ulcus tropicum) was never before reported from Calcutta and its suburbs, but during the great famine of 1943 and influx of the refugees from Assam in the same year for fear of Japanese invasion, an epidemic of naga sore occurred in Calcutta in 1943. The source of the infection was the evacuees from the endemic areas in Assam and the infection rapidly spread amongst the famine-stricken destitutes in and around the city. The incidence also disappeared as the condition of the country improved.

The number of scabies cases in the period of five years before the war was 3,541 out of a total of 40,000 cases, i.e. 8.8, say 9 per cent of the total number. The number of scabies cases during the period under review was 7,668 or 15.4 per cent, an increase of over 60 per cent. Similarly the number of skin lesions due to nutritional deficiency was only 288 during the five years before the war whereas the number of cases reported rose to 970. Even allowing the increased consciousness for this condition amongst the physicians the rise is more than 200 per cent. Congestion, lack of facilities for washing and contagion spreading from the evacuees and labourers account for the increase in the former, and the shortage of food, enormous increase in the cost of living and extensive adulteration of the food account for the latter -these are the gifts of the last war.

There are a few points of interest which require some explanation and these may be mentioned here:—

1. Ringworm of the scalp, which is essentially a disease of the children, is scarce in the plains of India and more so amongst the Indian children. Majority of the cases that are seen in this clinic are imported cases from schools situated in the hill stations, where European, Anglo-Indian and Jewish children are usually sent. Some schools in Calcutta have been found to be infected. The victims were Anglo-Indian boys and the original infection might have come from some of the hill stations.

Microsporum infection in the Indian children has not been reported as yet. The only fungus causing ringworm of the scalp in the Indian children as reported up to this time is Tricophyton violacium.

Tricophyton gypseum infection has been found in the Nepali (Gurkha) adults causing ringworm of the scalp. But it may be mentioned that the Nepalis are hill-tribes and probably belong to a different race (Mongolians).

2. Favus.—No case of favus was seen during these five years. Some time ago a few imported cases from Rajputana were investigated. A full study of the causative organism was made and a paper was published reporting

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		REMARKS			•		Biopsy done to confirm the diagnosis.					e due to pyoge	infection. No evidence of vitamin deficiency could be found.	Larvæ of some unknown hel- minth getting in the skin and	causing inflammation. Biopsy confirmed the diagnosis. The exact allorgen or cause of	determined by clinical examination in the out-patient department.
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	intramuscular cases were these cases were proughly investigated and cases determined.	an pin	allergic or ecomatitis in childrears. The derm	titis both primary or secondary from scabies, seborrhea, etc., have been classed together.	· ·	.ED	Clinical diagnosis. There is no definite criterion for the diagnosis of this symptom	сошраем.	From irritant plants.		•	No definite septic focus could be determined clinically but	the patients responded to the usual treatment.			Biopsy confirmed the diagnosis. Only clinical diagnosis. No	positive laboratory indings. Confirmed by laboratory findings.
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				Confirmed by laboratory find-	ngs. See also table II. Confirmed by laboratory find-	ngs. Do.	Do.	Do.				No definite cause could be	ascer canned.	Biopsy done to confirm the	anguosis.		
		Proportion male to	female	5:1	5.5:1	2.5:1	:		6:1	1,5:12 3::12		4 3 :: 2	4000	:		•	4:12
		X Sec	Female	33	599	21.	:	 1 197 30	ಣ	152		46	38 1,846 7 15	:			.00
		7	Male	160	2,740	51	62 44	706 84	18	1 24 12 191	7	30 30 30	3,691 15 15 27	64	•		37
1.00		l age	Number of cases	147	2,431 3	43	24	.: 790 73	16	25 25 11 137	•	8 168 28	3,143 10 10 17	63			29
		Usual	Number Between Number of (in of cases years)	16-32	16-40 16-40	16-40	16-32 25-40	20-40 16-40 16-40	4-25	16-32 10-25 10-40 15-40	:	30-45 16-45 20-45	5-20 4-16 30-40 16-30	30-40			16-40
	IDENCE	ım age	Number of cases	က	269	6	::	: :: ₀	H	.e 4 61	:	33.	169	:			0100
	AGE INCIDENCE	Maximum	Over (in years)	50	51	20	::	: :82	30	2000:	:	50	50 50 40 40	:			20
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		Minimum	Under (in years)	က	ო :	က	::	::-12	8	ည်းမေးမ	15	:000	1000	:	ıges.	granuloma of the skin.	:51
	F	rer- centage in rela-	the total	0.390	6.678 0.006	0.144	0.004	0.002 0.006 1.806 0.288	0.042	0.006 0.078 0.044 0.512	0.004		0.360 11.074 0.044 0.084	mycosis. 2 0.004	See pigment changes.	vuloma o	0.018
			of cases	195	3,339	72	63.44	1 3 903 114	21	39 22 256	25.25	252 52 52		See my		See grai	င်္ န
		Disease	•	Leishmaniasis (post-kala-	Leprosy	Oriental sore	Pyogenicum Rhinoscleroma	Rhinosporidium Sporotrichosis Syphilis— (a) Melano leucoderma	(b) Condyloma Tuboranlosis	(a) Bazin's disease (b) Lupus vulgaris (c) Scrofuloderma (d) Tuberculosis verrucosa	:	nitalis	Ichthyosis Impetigo contagiosa Keloids Kerion		:	Lichens:	
		Serial num-	ber	46	44	49	50	52 53 55	56	52 53 50 7	61	4 388	65 67 89 89	69		i	21.

Nov., 194	18)		AN A	LNAL	YSIS	Or :	00,000	517	.117	OB	1013	· ·	GHOSH			301
These are secondary lichenoid thickened and pigmented conditions due to continued	to conf	Biopsy was done on all the doubtful cases.	Confirmed by positive labo-	1401) Hadda	Confirmed by biopsy.		None confirmed by laboratory	indings.					There was epidemic in 1943. Usually naga sore does not occur in Calcutta (see ana-	19sis report.	Pediculosis is not common in	cases represent evacuees during the war.
	65 73 77 77	2:1	:	1.5:1	:	4:3	7:1	5:1		14.5:1	2:1	1.1:25	1:1 8:1 45:1	1.7:1	101 102 103	7:1
29 7.9 45	-4	55	:	32	;	19			1,498	ß	77	72	1 87 31	58	24 ₁	5.2
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6666 6666 6666	16.40	16-40	20-40	10-25	33	20-10	20-40	32-50	16-40	20-10	4-15	30-45	15-35	4-16	16-10	20-10
33.	00	14	:		:	23	က	:	364	51	63	28	 6	63	2000	0.01
50	20	20	of the skin).	07	:	50	20	:	50	20	16	20	50	20	200	50
239 cm	۲۹ :	9	oma of the	-4	:	=======================================	-	63.6	12°	18	67	41	-72	28	99	. ————————————————————————————————————
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0.370 0.038 0.606 0.454	0.01	0.344	See tuberculosis (granul	See granuloma. See pigment changes. 82 0.162	roderma.	0.296	0.016	0.012	12.598	1.588	0.078	0.270	0.340	0310	0.044	min defirie 0.066 0.024
185	24	172			See mycosis. See scleroderma 1 0.002	148	ø	90	6,299	914	39	135 0.270	2 0004 792 1.584 170 0.340	155	252	See vitem 33 12
72 Hypertrophio 7.4 Linearis 74 Planus 75 Lichenoid condition	76 Lineæ (striæ) atrophicæ	Lupus erythematosus	79 " vertucose cutis Lymphopathia venereum	Madura foot Melanosis Molluscum contagiosum	Mountain Mother Mycosis fungoides	82 skin): Actinomycosis (superficial	Reratolytica). Blastomycosis	: :		Sycosis P	Ringworn scalp	Moniliasie	or'		capitis corporis	us vulgaris

		Remarks	,	•	er of c general	hyperpigmentation of the skin without any apparent cause. There are no subjective or objective symptoms. The general health is not	impaired. Inese require a thorough investigation. These include blisters of the palms of the hands and soles of the feet due to other causes than ringworm infection.	Confirmed by biopsy. Scabies. In normal condition	r cent. T. quinquenniu war conditio
		Proportion male to	female	6:1 1.5:1 4:1 11:8	5:1 2:1 1.7:1	2:1 1.5:1 3:1	62 - 1 - 1 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5	$\begin{array}{c} \vdots \\ 5 \vdots \\ 1 \end{array}$	13:12 13:12 15:22 3:11
	,	¥	Female	1,232 3,33	72 58 42	137 25 2	46 104 17 12 201 10 6	2,481	34 37 6
	 	7 2	Male	6 1,781 12 11	204 120 73	231 39 6	98 138 17 17 11 11	6 5,187	13 15 15 17
		age	Number of cases	1,697 10 10	186 94 87	4 192 31 3	76 73 8 8 6 9 6 6	3,007	33 14 11
cld.		Usual age	Number Between Number of (in of cases years) cases	15-32 16-40 30-45 15-30	16-40 16-40	25-40 16-31 30-45 16-30	25-40 16-32 16-32 16-32 20-40 16-40 16-40 16-40 16-40	40–50 16–40 5–18	16-40 16-40 16-40 16-35
I—concld.	TDENCE	ım age	Number of cases	1 129 3	12 43 10	12 :	61 41 78 78 41 12 13 14 15 15 15 16 16 17 16 16 16 17 16 17 17 16 16 16 16 16 16 16 16 16 16 16 16 16	347	H & 4 & 1
TABLE	Абр імстремсе	Maximum	Over (in years)	40 51 50 50	50 50 50	50	: 2222222	511:	50 50 50 50 50
		ım age	Number of cases	1 47 2 6	: 50	. 676	: 115533333	1,342	9111100
		Minimum age	Under (in years)	3. 15. 10.	15	: ಜನವ	ដូលជាមួយដូច្ន	 15 3 nges.	15 15 15
	 о	centage in rela- tion to	the total	0.014 6.026 0.030 0.038	0.552 0.356 0.230	0.736 0.128 0.016	0.288 0.484 0.068 0.036 1.912 0.042 0.016 0.020	$See \ { m granuloma.} \ \left(egin{array}{c} 6 & 0.012 & & . \\ 6 & 0.012 & & . \\ 7,668 & 15.336 & & . \\ See \ { m pigment changes.} \end{array} ight)$	matitis. 0.082 0.156 0.042 0.190
		Total number	of cases	3,013 15 19	276 178 115	368 64 8	144 242 34 18 956 21 8 10		
		Disease		Pigment changes: Loss of pigment: Albinism Leucoderma (vitiligo) Leucoprichia	Hyperpigmentation: Chloasma (seborrhæic) Melanosis, generalized (un-	Ottyriasis rosea Pityriasis rosea " rubra " pilaris	Pompolyx Prickly heat Prurigo Pruritus Psoriasis Psoriasis Pyoderma (generalized) Pyosis mansoni Raynaud's disease Rhinoscleroma	Rhinosporidium \\ \text{Rodent ulcer} \\ \text{Sarcoids} \\ \text{Scabies} \\ \text{Schumberg's, disease} \\ Schumberg's, disease,	Seborrhœie dermatitis " body and face scalp cyst Seleroderma morphea
;		Serial num-	Der	99 100 101 102	104	107 108 109	110 111 113 114 116 117	119 120 121	122 123 124 125 125

	Includes insect bite.		•		Diphtheritie.	The incidence of skin symp-	9 3 5	the to t				
	2:1	.: .:	••		3:1	ት : 1	1.6:1 2:11	1146	11.		· ·	
	18	70	8 187	10 H	7.0	26	: ∞240	£ 75	c1	⊢ 1€ C	·1	
	37	309 · 6	325	1-000	248	391	185	32 173		- co to		
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	99	16-40	16-30 25-40	35-45	16-32 16-32 16-32	ç		16 45	20-10 16-35	16-20 16-35	:	
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t suchname to	0.016	nuloma. 0.034 0.618	0.012 0.016 1.024	0.024	0.008 0.654 0.072		0.932	0.014	0.018	0.002	0.008	nuloma.
200	266 Bit	See granuloma. 17 0.034 309 0.618	6 . 8 . 512		327 36		466 48 169	83.72	218	·*£	4	See granuloma.
	:::	:::	 organ	:::	disease) defi-	:::	:::	: : : : : : : : : : : : : : : : : : :	:::	m (Ka- ease).	:
S. Complete Lands	Soft sore	Sporotrichosis Stomatitis (coccal) Sycosis barbæ (coccal)	Trichotillomania Urticaria (including	0 c -	Veldt sore Verruca (warts) Von Recklinghausen's	(neuro nbriomata). Vitamin (nutritional)	Unclassified general Keratosis follicularis Lichen spinulosus	Pellagra Phrynoderma Porokeratosis Dit. dening	Xanthelasma Xanthelasma palpebrarum	Xanthoma diabeticorum "tuberosum Xeroderma	", pigmentosum (Yaws
	127	129	131 132 133	134	137 138 139		45 142 143 143	24. 44. 45.	142 148	150	152	

Comments.—Of the common diseases scabies heads the list with 7,668 cases (15.33 per cent). Next to scabies fungus infection accounts for 8,382 cases, ringworm of the body 6,299 and ringworm of hair including infection in the scalp 983 cases. Most of the 39 cases of ringworm of the scalp are imported. Only 135 cases of Monilia infection have been mentioned, a number too small for this country. Impetigo stands third have been mentioned, a number too small for this country. Impetigo elementitis with 4,243 cases need more study. There are only 970 cases of nutritional deficiency. This figure appears to be rather low. Finta cases clinically resembled resembling the South American pinta are not uncommon and 114 doubtful cases of pinta have been mentioned. These cases clinically resembled pinta but except in 2 cases spirochaets could not be demonstrated from the lesions. They have been listed under granuloma (syphilis) for convenience only. There were only 6 cases of surcoidoses and 18 of lipoidoses.

the finding of a new species Achorion actoni (Dey and Maplestone, 1936). Favus is common in Kashmir and North Punjab but it does not occur in the plains of India except in the desert areas of Rajputana and Sind.

- 3. A few cases of blastomycosis have been recorded but in none of them the clinical diagnosis was confirmed by laboratory examination. Hence the diagnosis of these remains in doubt. There is no published record of its incidence from any other places in India with positive laboratory findings. It is said to be common in South India but on further enquiry it appears that there is no laboratory confirmation of the clinical diagnosis. It is strange that in a subcontinent like India situated in the tropics no case of blastomycosis has been reported with positive laboratory findings.
- 4. Leishmania infection of the skin has two distinct types with different ætiological factors. Its geographical distribution in India has also a distinctive feature. Roughly speaking the eastern half of India is endemic for Leishmania donovani infection causing kala-azar and its sequelæ, 'the post-kala-azar dermal leishmaniasis' and in this area Leishmania tropica infection causing oriental sore is rare. In the western half or to be more definite in the northwestern quarter of India Leishmania tropica infection causing 'oriental sore' is prevalent and kala-azar and its frequent sequelæ the post-kala-azar dermal infection does not occur.
- 5. Lymphopathia venereum (climatic bubo, lymphogranuloma inguinale).—Though Calcutta is a big port lymphopathia venereum is very rare. It is common in Madras which is a smaller port than Calcutta.
- 6. Madura foot.—It is common in South India in and around the Madura district. It has also been reported from Rajputana and Kathiawar. In Bengal this disease is rare, a few cases only have been reported from the districts of Howrah and Midnapore.
- 7. Filariasis.—These cases have been excluded from the list of the skin out-patient department as the filaria research department deals with cases of filariasis and guinea-worm infection. The number of attendances during the last 5 years have been given in table II. The figures have been kindly supplied by the filaria research officer, Dr. N. V. Bhaduri.
- 8. Guinea-worm.—Infestation is endemic throughout the western ghat and is also found in the Central Provinces, Sind and Rajputana and Western Punjab. In the eastern part of India guinea-worm infection has not been reported. The cases reported here are imported cases from the endemic areas and the figures have been supplied by the filaria research efficer.
- 9. Leprosy.—The British Empire Leprosy Association and its branches in India deal with the problem of leprosy. The figure shown in

Ģ			rtion to Remarks	· ·	4:1 The figures have been supplied by Dr. N. V. Bhaduri, filaria	research officer, S. T. M.	The figures have been supplied	leprosy research officer, S. T. M.
			Proportion male to		4	:	:	
ers in t		į	. X = Z	Female	1,305	•	1,042	
numbe			1	Male	4,932	:	7,371	í
of the	•		ım age	Number of cases	3,082	All males.	4,395	,
${ m I}$ $xclusive$			Optimum age	Between (in years)	30-49	25-40	20-40	
Table is exclusive of the numbers in table I	E 27 24 26	a Nam	Maximum age	Over Number Between Number (in of (in cases years)	606	:	19	
this ta	Ace Inches	יייי איזי איזיי	Maxim		51	:	8	
ases in			ım age	Under (in of years)	7	,:	179	
er of ca			Minimum age	Under (in years)	က	:	∞	
The number of cases in		Dor	centage in rela- tion to	the total figure	:	;	:	
T			Total number	or cases	6,184	10	8,413	
		•	Disease		sis	(Guinea-worm) dracontiasis	: :	
		•			Filariasis	(Guine	Leprosy	•

the list indicates the number of cases that reported and were diagnosed in the skin outpatient department. This figure is only a part of the total number of cases that are dealt with by the leprosy department. But the general analysis compares favourably with the total

figure. 10. Industrial dermatitis.—One hears little about the industrial dermatitis in this country. India is being rapidly industrialized now and our dermatologists should be prepared to tackle this problem in the near future. During the last war the writer came across two such instances. Many temporary factories, big and small, were built in and around Calcutta for the production of the war materials. In one big factory the loss of labour from dermatitis was Here the labourers had to work significant. with their hands dipped in kerosene oil. On analysis the kerosene oil was found to contain more than the usual quantity of sulphur as impurity, but that was the only oil available at the time. The labourers suffered from a painful dermatitis of their hands and feet, some of which even went to the stage of ulceration.

In the second instance the dermatitis was characterized by inflammation, keratosis and hypertrophy of the hair follicles. Both the extremities and the lower part of the body were mostly affected. The condition was due to the impure lubricating oil. This occurred mostly in small factories and was due to the impure lubricating oil being sprinkled all over the extremities and lower part of the body of the mechanics.

Careful observation, simple remedies and easy precautionary measures soon removed all the troubles.

The study of skin diseases in this country is still in infancy and the last word about prophylaxis and treatment of many essentially tropical diseases has not yet been said.

REFERENCE

DEY, N. C., and MAPLE- I.J.M.R., 23, 687. STONE, P. A. (1936).

THE INCIDENCE AND CAUSATION OF GLYCOSURIA IN PREGNANCY

Part III

By K. C. BATLIWALLA

Department of Physiology, Seth G. S. Medical College, Parel, Bombay 12

THE investigations reported previously (Batliwalla, 1947, 1948) showed the possibility of a low vitamin C and calcium content of blood playing an important rôle in the causation of glycosuria in pregnancy. This conclusion was based mainly on the findings of blood levels of vitamin C and calcium in pregnant women and their correlation with the incidence of glycosuria.

It was however thought essential to carry out further studies so as to furnish an experimental

proof in support of the above statement. In human subjects it was done by administering vitamin C and calcium in suitable doses and then studying their effects on glycosuria. The probable rôle of vitamin C in the utilization of glucose was investigated in the frog and the effects of lowering of blood calcium and vitamin C on the possibility of causing glycosuria were studied in the guinea-pig.

The present paper deals with the results of such experiments. Estimations of sugar, calcium, vitamin C in blood and urine were done by methods already reported (Batliwalla, 1947, 1948). For the sake of convenience the findings are discussed under two headings: (1) human experiments and (2) animal experiments.

(1) Human experiments

Glycosuria cases from amongst the in-patients of the antenatal ward of the Seth Nowrosji Wadia Maternity Hospital whose detailed examination of urinary sugar, blood sugar, blood vitamin C, serum calcium, etc., had already been done were treated with calcium and vitamin C. 'Calcinol Granules irradiated with vitamin D', a preparation of the Labora-tories of Messrs. Raptakos Brett & Co., Ltd., containing per spoonful 0.4 gm. of calcium, 0.2 gm. of phosphorus, 0.5 gm. of magnesium, a trace of fluorine and 3,000 international units of vitamin D were administered. So also 'Celin Tablets', each tablet containing 50 mg. of crystalline vitamin C, a product of Glaxo Laboratories, were given by mouth. Each patient was given 2 tablets of Celin and 1 teaspoonful of Calcinol (with vitamin D) granules 3 times a day. The sample of urine passed 3 hours after the usual midday meal was examined for sugar. On the 3rd day at the latest, the sugar disappeared from the urine. The record of results obtained before and after the administration of calcium and vitamin C is given in table I and the blood sugar and the urinary sugar curves before and after treatment are illustrated by graph 1.

From table I and graph 1 the following facts are manifest:—

1. The urinary sugar completely disappears from each and every case after the combined treatment with vitamin C and calcium on the 3rd day. The mean rise in the blood vitamin C and serum calcium level is from 0.855 mg. to 1.255 mg. and 9.09 mg. to 9.72 mg. respectively.

2. The average fasting blood sugar level rises from 75.0 mg. to 84.6 mg., i.e. 9.6 mg., similarly at the end of the 1st hour after administration of 50 gm. of glucose, the level which stood at 116.6 mg. prior to treatment rises to 126.9 mg. after administration of vitamin C and calcium, i.e. the rise is 10.3 mg. From these data it could be concluded that the increase of blood sugar is due to the rise of renal threshold for glucose.

Vitamin C alone was then tried in pregnant glycosuria cases. Two tablets of Celin three

a day. Glucose tolerance test and estimation of serum calcium was carried out before and after treatment. Seven days after this treatment the urine passed after the noon meal was sugar-free or showed a trace. When urinary sugar was estimated in the fasting sample, one case showed 0.1 per cent of glucose and after administration of 50 gm. of glucose by mouth 6 cases showed sugar in the urine though to a lesser extent than what they had showed prior to this treatment.

The results obtained are recorded in table III and the blood and urinary sugar curves before and after treatment are illustrated in graph 3.

From table III and graph 3 the following important facts are observed:—

After administration of adequate doses of calcium by mouth, the fasting urine of 9 cases out of 10 becomes sugar-free one week after the

The average serum calcium level rises from 9.22 mg. to 9.82 mg. per 100 cc. after this treatment.

The average fasting blood sugar after a week's treatment rises from 78.1 to 84.6 mg., i.e. 6.5 mg., whereas the rise is 9.6 mg. when both vitamin C and calcium are administered and 6.6 mg. when vitamin C alone is given. Besides the blood sugar level after glucose administration, which at the end of the 1st hour stood at 117.7 mg. rises to 120.1 mg. after this treatment, i.e. it shows a rise of 2.4 mg. instead of 10.3 mg. when both vitamin C and calcium are administered and 3.9 mg. when vitamin C alone is given. The obvious inference is that the action of calcium alone in raising the renal threshold for glucose is not as efficacious as that of the combined action or even that of vitamin C alone.

The effects of suitable doses of calcium and vitamin C on the renal glycosuria cases in the

Table III
Record of cases before and after calcium treatment

			Recor	a oj ca	ses vejo	re ana c	ijier cai	ceum er	earmen	l	
				Grucosi	TOLERAN	NCE TEST			TAGE OF		Mg. per 100 cc.
Case number	Treatme	ent	Blood	sugar co	ntent in	mg. per	100 cc.		IN ORINI		
1			Before glucose	∄ hour after	1 hour after	1½ hours after	2 hours after	Before glucose	1 hour after	2 hours after	Serum calcium
515	Before After	•••	70 76	122 128	119 120	105 99	60 65	0.3 nil	0.4 nil	0.8 nil	9.2 9.5
503	Before		61	102	90	79	65	0.1	0.7 0.35	0.4	8.6 9.7
370	After Before	••	67 83	111 100	98 110	86 95	70 80	nil nil	0.33 nil	0.1 nil	9.8 10.0
168	After Before		86 70	107 120	108 134	94 112	84 74	nil 0.4	0.6	0.5 0.2	10.0 10.3
314	After Before	• •	88 63	124 90	143 88	116 80	74 68 74	nil 0.2 nil	0.3 0.6 0.1	0.2 0.3 nil	8.8 9.6
469	After Before	• •	70 83	95 132	90 163	82 130	75 80	0.5 nil	0.6 nil	0.55 nil	9.6 10.0
472	After Before	• •	90 106	130 131	150 111	128 97	93 98	0.3 nil	0.6 0.2	0.4 nil	8.4 9.8
475	After Before	••	110 83	130 99	113 117	106 95	80	0.1	0.5 0.1	0.6 0.3	· 94 9.7
427	After Before		88 74	114 101	119 113	96 86	84 76	nil 0.1	0.3	0.2	9.0 9.7
	After		81 88	99 120	115 132	103 111	91 86	nil 0.35	nil 0.49	nil 0.3	9.4
220	Before After	• •	90	127	145 117.7	108 99.0	94 75.7	0.1 0.235	0.2 0.509	0.1 0.415	9.9 9.22
Mean	Before After	• •	78.1 84.6	111.7 116.5	117.7 120.1	101.8	81.4	0.01	0.125	0.07	9.82
1		- [<u> </u>				<u>'</u>				

treatment and not in 3 days as is the case when both vitamin C and calcium are given, nor in 5 days as is the case when vitamin alone is administered.

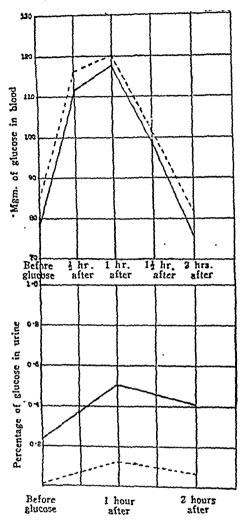
After administration of 50 gm. of glucose by mouth, six cases showed glucose in the sample of urine passed at the end of the 1st hour (though the amount of glucose passed is very much reduced); whereas with the combined treatment all cases were sugar-free and when vitamin C alone is used only two cases showed small amounts of glucose.

males were studied. It took months to hunt out these cases, as the cases to be selected were only such as were willing to co-operate in the experimental part of the work.

Detailed examination of blood sugar (glucose tolerance test), urinary sugar, blood vitamin C and serum calcium were first carried out in these cases. Each case was then made to take 1 teaspoonful of Calcinol and 2 tablets of Celin three times a day. Morning urine was daily examined for sugar. On an average, about the 12th day, a substantial decrease or complete disappearance

Graph 3

Blood sugar and urinary sugar curves before and after calcium treatment



of urinary sugar was noticed. The record of these 5 cases before and after the treatment is given in table IV and the illustration of the blood sugar and urinary sugar curves is in graph 4.

From table IV and graph 4 the following facts are manifest:—

The fasting urine of two cases out of five became sugar-free on the 12th day after combined treatment with vitamin C and calcium. One sample of urine was sugar-free before the treatment commenced whereas two others showed a marked reduction in the quantity of glucose.

After administration of 50 gm. of glucose by mouth all cases do show sugar in urine but a far lesser degree.

The average vitamin C level in blood rises from 1.34 mg. to 1.98 mg. and the average serum calcium level rises from 9.62 mg. to 9.92 mg. It may be pointed out here that in true renal glycosuria many different factors probably operate to lower the renal threshold. Calcium and vitamin C treatment does not therefore produce a well-marked rise in renal threshold as in pregnancy cases.

(2) Animal experiments

The results obtained from human subjects were further corroborated by suitable experiments on animals. These were of two types:

- (a) The perfusion experiments on frog's heart,
- (b) Feeding experiments on guinea-pigs.
- (a) Perfusion experiments on frog's heart

Some workers reported a fall in the fasting blood sugar level and in sugar tolerance curve after the administration of vitamin C. As shown

TABLE IV

Record of renal glycosuria in males before and after treatment with vitamin C and calcium

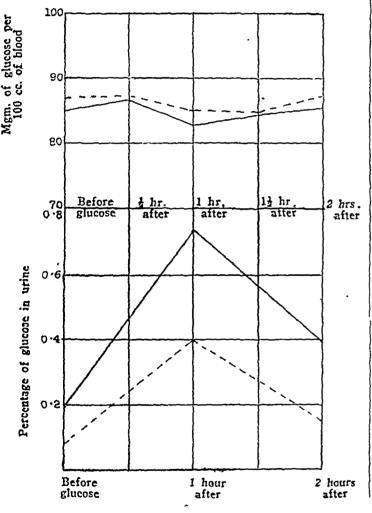
						~~~~		<del></del>			O una ca	
Case number	Treatn	ient	Blood		tent in	mg. per	100 cc.	PERCEN	TAGE OF	GLUCOSE	Mg, pi	er 100 cc.
namber				(	1		<del></del>	ļ				
			Before glucose	hour after	1 hour after	14 hours after	2 hours after	Before glucose	1 hour after	2 hours after	Blood vitamin C	Serum calcium
A	Before	.,	85	87	82	84						
в	After Before	•••	87 84	88 86	84	86	85 87	0.1 nil	0.5 0.2	0.25	1.2 2.1	9.4
С	After Before	••	85 84	87 85	82 85 80	84 85	85 88 83	0.05 nil	0.3 0.1	0.16 nil	1.0 1.8	9.8 9.6
D	After Before		86 86	85 87	83	81 82 85 87	85	nil nil 0.3	0.4 0.2	0.15 0.05	1.3 1.7	9.8 9.5
E	After Before	::	87 87	89 88	84 85 86		86 88 87	0.1	1.1 0.5	0.6	1.5 1.9	10.0 9.8
Mean	After Before After	•••	90 85,2 87,0	89 86.6 87.6	88 82.8 85.0	87 84 84.2 84.8	87 88 85.3 87.2	0.5 0.3 0.19 0.08	1.4 1.0 0.74 0.4	0.8 0.4 0.39 0.15	1.7 2.4 1.34	10.1 9.8 9.9 9.62
		********		·						0.10	1.98	9.92

previously, a rise was found in the fasting blood sugar level and in the sugar tolerance curve after the administration of vitamin C and calcium. In order therefore to study the action of vitamin C on carbohydrate metabolism, the following perfusion experiments on frog's heart were undertaken:

A canula was inserted into an excised frog's ventricle and tied tight. The interior of the ventricle was washed with the perfusion fluid.

#### Graph 4

Blood sugar and urinary sugar curves before and after calcium and vitamin C treatment in renal glycosuria cases in males



The perfusion fluid was then added in the canula up to the 2 cc. mark.

Two varieties of perfusion fluids were used, viz, fluid A and fluid B. 2 cc. of fluid A were made up of Ringer's solution containing 2 gm. of glucose and 0.5 unit of insulin. 2 cc. of fluid B were made up of Ringer's solution containing 2 gm. of glucose, 0.5 unit of insulin and 0.02 mg. of vitamin C.

In the first experiment fluid A was perfused for the first two hours and fluid B for the second two hours and vice versa in every alternate experiment. Thus fluid A and fluid B were used first in every alternate experiment. The heart that was perfused was placed within a cylindrical glass vessel and the apex of the ventricle was tied on to a recording lever.

The beating of the heart was recorded at the commencement and at the end of the experiment and was found on all occasions to be similar in force and frequency.

Each day fluid A and fluid B were freshly prepared and the sugar contents of these fluids before and after the experiment were estimated and from the result of these estimations the sugar utilized by the frog's heart was calculated. Table V gives a detailed record of these results.

It could be seen that percentage of sugar in fluid A actually shows a rise in some cases. This is because a certain amount of sugar is excreted from the heart into the fluid (Clark, Gaddie and Stewart, 1931). However with fluid B sugar is always utilized. This is because of vitamin C which being present in fluid B stimulates utilization of glucose. The rise in the fasting blood sugar level and in the sugar tolerance curve in pregnant and renal glycosuria cases noticed by me was explained on the assumption that the renal threshold in these cases was raised with the administration of vitamin C. Had it not been for the greater utilization of sugar, the rise of blood sugar level would have been more marked after vitamin C administration.

TABLE V

		SUGAR CONTEN	T OF FLUID A	Sugar conten	T OF FLUID B	Mg. of Suga	R UTILIZED BY T WITH
Number Weight of heart in gm.		Mg. Initial	Per cent Final	Mg. Initial	Per cent Final	Fluid A	Fluid B
1 2 3 4 5 6 7 8 9	0.81 1.05 0.62 1.25 0.85 0.55 1.21 0.76 1.42 1.14	95 106 75 89 95 105 105 101 88 88	98 113 73 85 96 108 105 98 88 90	96 110 77 110 98 101 98 95 . 88 84	91 95 45 74 72 78 65 63 52 70	$\begin{array}{c} -0.06 \\ -0.14 \\ +0.04 \\ +0.08 \\ -0.02 \\ -0.06 \\ 0 \\ +0.06 \\ -0.04 \end{array}$	+ 0.1 + 0.3 + 0.64 + 0.72 + 0.52 + 0.46 + 0.66 + 0.64 + 0.72 + 0.28

#### (b) Feeding experiments on guinea-pigs

Three guinea-pigs were kept on a diet consisting of 60 parts of starch, 15 of powdered egg white, 10 of groundnut oil, 5 of sodium chloride and 10 of cane sugar. This diet lacks calcium and vitamin C. These animals were kept in a metabolic cage.

The animals were examined at the commencement of the experiment and then at intervals till death which occurred at the latest on the 27th day. Their urine was daily examined for sugar, but it was always found absent although there was loss of weight and submucous hæmorrhages. This shows that a lowering of the blood calcium and vitamin C by itself cannot cause glycosuria. The glycosuria of pregnancy as already stated (Batliwalla, 1948) is due to some local disturbing factor which when associated with low calcium and vitamin C content of blood reduces the renal threshold for glucose.

#### Conclusion

On administration of adequate doses of vitamin C and calcium, there is a complete disappearance of pregnancy glycosuria. Also, there is a rise in the blood sugar level (fasting as well as after administration of glucose). The efficacy of each of these two substances is less than that of their combination and vitamin C administration per se raises the renal threshold to a greater extent than calcium administration

Administration of suitable doses of vitamin C and calcium in renal glycosuria cases in males raises the renal threshold for glucose, but here the rise is less marked than in the foregoing cases inasmuch as here some unknown causative factors continue to be in operation.

In perfusion experiments on frog's heart, when the perfusing fluid contains vitamin C, the utilization of glucose is greater.

Guinea-pigs on a diet lacking in calcium and vitamin C show no sugar in urine.

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#### INCIDENCE OF FRONTAL OR METOPIC SUTURE AMONGST PUNJABEE ADULTS

By INDER JIT, M.S.

and

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FRONTAL bone is developed in two halves. At birth they are united together by frontal or metopic suture which usually disappears between sixth and tenth years. In some individuals this suture remains complete throughout life and the condition is called 'Metopism'. Metopism is said to be more frequent amongst higher races than amongst lower races and in brachycephalics than in dolichocephalics. According to Gray (1946) it is present in 9 per cent of skulls. According to Rau (1934) metopism was present in 4 per cent of cases in skulls representing the Dravidians of the Madras Presidency. No case of metopism is seen in authropoid apes though according to Schwalbe (quoted by Rau, 1934) it is found in Colobus and Semnopithecus.

The remains of the frontal suture can be seen in a large number of adult skulls at or about glabella. No statistics are, however, available regarding their percentage and appearances.

#### Present work

We examined eighty adult skulls from dissection-hall subjects of the King Edward Medical College, Lahore, during the years 1944-47. The subjects were all Punjabees and were not classified according to communities or age groups. Only adult skulls were examined. The following are our findings:

,		Number of cases	Percentage
Absent Present—	••	14	17.5
Complete (see fig	ure	4	5.0
Incomplete		62	77.5
Total present,	••	66	82.5

#### Incomplete Sutures 1. Single

		Number of cases	Percentage	
(a)	without sutural	36	45.0	
		Average length Maximum " Minimum "	8.7 mm. 24.0 mm. 4.0 mm.	

(In case 13 the direction of the suture was upwards and to the right. In case 78 direction was slightly to the left.)

- (b) Linear with a bone Length .. 8, 10 and 12.5 mm. sutural at the lower end (see figure 2, case 50).
- (c) Linear with a sutural bone Length .. 9 and 22 mm. at the upper end (see figure 3, case 17).

Number of cases	Percentage
(d) Linear with two 1 sutural bones Length at the upper end.	1.2 8 mm.
(e) Only a sutural 10 bone present Average dimension at the site of Maximum ,, the lower end Minimum ,, of the suture.	12.5 8 × 6 mm. 15 × 10 mm. 6 × 4 mm.
Total 6 52	65.0

#### 2. Double

- (a) In three cases both the sutures were vertical—13, 13 and 6.5 mm. long and 3, 6 and 4 mm. apart.
- (b) In one case the suture was 'H' shaped, each limb being 8 mm. long with a maximum distance of 8 mm. in between (see figure 4, case 59).
- (c) In one case the sutures 13 mm. long converged at the upper end so that the distance in between them was 4 mm. above and 6 mm. below.
- (d) In one case the sutures 21 mm. long converged at the lower end so that the distance in between them was 9 mm. above and 4 mm. below.
- (e) In one case the sutures went upwards and outwards from the lateral angle of the frontonasal junction towards supracrbital margin on each side (see figure 5, case 14).
- (f) In one case the sutures went outwards from nasion towards the orbit (see figure 6, case 56).
- (g) In one case the two sutures united at the nasion giving a 'V'-shaped appearance.

				nber of ases	Percentage
	Total	••	-	9	11.25
3.	Single	below	but	double	above
				1	1.25

Frontal bone is ossified from two main primary centres, one for each half of the bone. Various types of double sutures seen in 11.25 per cent skulls suggest that the bone in the region of the glabella may be ossified from more than two centres.

According to Cunningham (1943) obliteration begins usually at the level of the frontal eminences extending upwards and downwards from there, so that before the suture is completely closed, traces may be left only above and below. In our series no remains of the suture could be seen at the upper end of bones.

#### Summary

1. Eighty adult Punjabee skulls from dissection-hall subjects were examined for the remains of the frontal sutures. It was found that metopism or complete frontal suture was present in 5 per cent of cases.

- 2. Remains of the frontal sutures could be seen at the lower part of the bone in 77.5 per cent of cases.
- 3. In about 11 per cent of skulls, the remains of the suture were represented by double sutures at or about the glabella, suggesting thereby that this part of the bone in these skulls was ossified from more than two centres.
- 4. Since the remains of the frontal suture were not seen at the upper part of the bone, it appears that the closure of the suture takes place from above downwards.

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#### A REPORT OF 46 CASES OF ANÆMIA IN THE PUNJAB WITH SPECIAL REFER-ENCE TO NUTRITIONAL MACROCYTIC AND ADDISONIAN ANÆMIA

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A series of forty-six consecutive anemia cases, studied at Mayo Hospital, Lahore, in 1939, is being reported to record the findings of interest. The series is not representative of the provincial population, because the hospital, although fed by the whole province for its clinical material, had only a few beds for women and children. There was also considerable selection of material as only severe anemia cases could secure admission.

#### Technique

The Sahli's hæmoglobinometer used was standardized. The hæmatological observations recorded were all made by a single observer on capillary blood. Cytological nomenclature adopted was after Whitby and Britton (1937).

Tallqvist scale and Eve's halometer which were in routine use at the institution were tested against Sahli's hæmoglobinometer and Price-Jones curves respectively. Duplicate hæmoglobin readings were made on 113 samples of blood by the two methods and both Tallqvist scale and Eve's halometer were found to be unsatisfactory in the study of anæmias (Chhuttani, 1942).

The mean diameter (Price-Jones) was measured only in thirty-one instances. The

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Fig 1.—Case 16.



lug 2-Case 50



Fig. 3 -Case 17.

## PLATE XXXII INCIDENCE OF FRONTAL OR METOPIC SUTURE AMONGST PUNJABEE ADULTS: INDER JIT & M. A. SHAH. (O. A.) PAGE 507

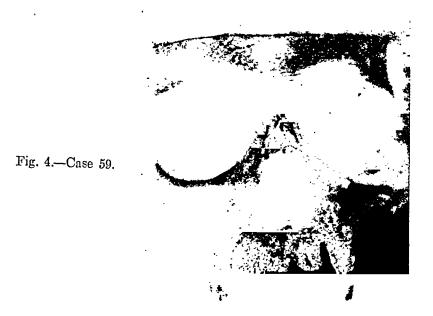


Fig. 5.—Case 14.





Fig. 6.—Case 56.

corpuscular volume estimations had to be excluded on account of certain technical errors.

Van den Bergh reaction was done according to the original method of van den Bergh with the modification that for indirect reaction 1 cc. of absolute alcohol was added to 1 cc. of serum and after centrifugalization equal quantities of the supernatant fluid and diazo reagent were used. A faint violet colour was regarded as normal. Quantitative estimation of serum bilirubin could not be carried out.

#### Data and Classification

The patients were derived from various districts of the Punjab and represented age groups up to 85 years. There were one child and two women.

Hematologically there were twenty-two hypochromic, eight orthochromic and sixteen hyperchromic anæmias.

Ætiologically the cases could be classified as dyshæmopoietic 40 cases (87 per cent), hæmolytic 1 case, hæmorrhagic 1 case and indeterminate 4 cases (3 of which could not be followed up). The dyshæmopoietic group could be split into (i) Iron deficiency—21 cases. Eighteen had hookworm infestation, two were associated with gastro-intestinal malignant disease and one appeared purely nutritional. (ii) Hæmatopoietic principle (or principles) deficiency-14 cases. Two had Addisonian anæmia, seven nutritional macrocytic anæmia; one was associated with spruc, one with tuberculous enteritis, one with chronic bacillary dysentery and two with gross chronic splenomegaly (spleens below the umbilious) uncertain origin. (iii) Toxic dyshæmopoieses-3 cases, one each of pyopneumothorax, plcurisy with effusion and acute rheumatic fever. (iv) ' Metabolic ' dyshæmopoieses-2 cases of myeloid leukæmia.

Nutritional macrocytic and Addisonian anæmia cases are selected for further comment for the purposes of this paper.

#### Nutritional Macrocytic Anamia (N.M.A.)

All the seven cases of N.M.A. in this series were males. All were below thirty years except one who was just above fifty. Diet consumed in six of the seven cases had been grossly deficient over long periods in animal proteins and green vegetables. All of them came from a very poor economic stratum,

One case showed well-marked koilonychia and had histamine-fast achlorhydria. In view of this nail deformity Price-Jones curve was drawn the second time: this confirmed the original high mean corpuscular diameter  $(8.003 \text{ and } 8.07\mu)$ .

Two cases had moderate enlargement of the spleen presumably malarial in origin. Four had hookworm infestation: egg counts were not done.

All cases had advanced aniemia, the highest red cell count being 2.7 and the lowest 0.77 million per c.mm. There were three cases with total white cell counts of less than 4,000 per c.mm. Only one of these three had an enlarged spleen. Polymorphonuclear: lymphocyte ratio was inverted in three instances two of which were from the above three leucopenics.

Bone marrow differential counts were done in six instances (see table). It will be seen that (i) there was no homogeneous, normoblastic, erythroblastic or megaloblastic reaction. (ii) The white cells also showed an increase in premature elements.

Price-Jones curves were drawn in six cases. Average mean diameter was  $8.18\mu$  (S. D. 0.49). Average standard deviation was 0.94 (S. D. 0.31). In one instance the curves were drawn before and during treatment and showed an interesting point. The first curve brought out only a suspiciously macrocytic mean diameter of 7.66  $\mu$  but within sixteen days of parenteral liver therapy the diameter went down to  $7.21\mu$  and the macrocytosis of 12.8 per cent disappeared completely, confirming thereby the initial presence of pathological macrocytosis.

#### Addisonian Anamia

Two cases in this series diagnosed as Addisonian anæmia have already been reported (Taylor and Chitkara, 1940). Follow-up information, result of sternal marrow examination and Price-Jones curves became available subsequently, and these are strongly supportive of the original diagnosis questioned by Napier (1939). Some details are published again with permission.

#### Case 1

Male land-owning agriculturist, from a fertile district, forty years old, was admitted with fatigue and breathlessness on minor exertion, sore mouth and diarrhea—total duration 18 months, diarrhea and sore mouth being of shorter duration. Onset insidious. He had always been a very fit individual previously and there were no relevant past illnesses. Had always taken a good mixed diet with liberal supplements of milk. On examination was well built but looked very pale. Skin bore a definite lemon hue, conjunctive being sub-icteric. Diffuse moderate pigmentation of the face present. Slight edema feet. Nil organic in respiratory, circulatory or nervous systems. Spleen and liver not palpable. No buccal inflammation.

Hæmatologically the picture was typical of a severe macrocytic anæmia. R.B.C. 1.19 million per c.mm., mean corpuscular diameter  $8.03\mu$ , W.B.C. 6,250 per c.mm., neutrophils 40 per cent, lymphocytes 60 per cent, indirect van den Bergh was moderately positive. Sternal marrow showed a high percentage of megaloblasts (see table).

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TABLE

Bone marrow differential counts of six N.M.A. and two Addisonian anamia cases

' J		onian mia	Nutritional macrocytic anæmia					
Case number '4	1	2	i	2	3	4	5	6
Name of marrow cells								
Polymorphonuclears in per cent of nucleated cells—			-					
Neutrophils	13.0	38.4 • •	16.7 0.7	16.0 0.4	27.5 ··	20.2	10.5 1.5	24.5 1.5
Basophils	••	••	••		 	0.2	••	•••
Neutrophils Eosinophils	20.5	11.6	20.0 0.3	37.6	24.0	28.5	15.0	36 5 0 5
Basophils Myelocytes in per cent of nucleated	•••		••	•••			••	
Neutrophils Eosinophils	17 0	20.8	25 3 0.7	9.3 0.8	125	13.0	19.0	190
Basophils Premyelocytes in per cent of nucleated cells.	• • •	• •	••	• •		02	3.1	0.5
Myeloblasts in per cent of nucleated cells.			••	0.4		0.2	05	0.5
Lymphocytes in per cent of nucleated cells.	1.0	2.0	5.6	2.0	0.5	7.0	25	- 4.0
Mononuclears in per cent of nucleated cells.	••	••	••	••			••	
Normoblasts in per cent of nucleated cells.	21.0	14.0	20.0	31.6	31.0	18.0	27 0	80
Erythroblasts in per cent of nucleated cells.	12.0	3.6	5.3	2.4	4.5	9.0	9.0	35
Megaloblasts in per cent of nucleated cells.	15.0	*8.6	5.5	0.4		1.5	12.0	15

*Two Ehrlich's megaloblasts seen.

Price-Jones curve showed a wide base and a shift to the right. Histamine-fast achlorhydria was detected and was found to persist after cure of the anæmia as well as six months later while under maintenance treatment. Stools showed no protozoal or helminthic infection; fat analysis of dried stools was normal. Patient had to leave hospital while red cell count was under 3.5 million but reported for anahæmin injection (2 cc.) every six weeks. Improvement clinically and hæmatologically was consistent and he was back to full work, ploughing fields, etc., within six weeks after discharge. Bowels became normal soon after liver therapy was instituted.

A brother of the patient was examined and found to be well built and in excellent nutritional state. Remaining relations were stated to be all fit and healthy.

#### Case 2

Male land-owning agriculturist, eighty years old, was admitted the second time to Mayo Hospital in July 1939, with signs and symptoms of severe anæmia. Had been in hospital for the first time in December 1937 with severe 'hyperchromic' anæmia (R.B.C. count 1.1 million). Had histamine-fast achlorhydria.

Had responded maximally to anahæmin and (R.B.C. 5 million) within three was cured months. Reticulocytosis of 46 per cent had resulted on the sixth day after one injection of 4 cc. of anahæmin. Maximum expected reticulocytosis was 35 per cent (Minot et al., 1928). On leaving hospital gave up maintenance treatment and after feeling well for four months, insidiously relapsed and deteriorated progressively till the second admission. Now the clinical picture was that of a severe anamia in a well-padded individual. Conjunctive had sub-icteric tinge and skin was lemon yellow. Tongue showed papillary atrophy but there was no buccal inflammation. Liver was palpable two fingers below costal margin but not tender. Spleen was not palpable. Lungs showed early signs of chronic bronchitis and emphysema. Slight ædema feet present. Blood picture showed a severe macrocytic anæmia with leucopenia. R.B.C. 1.43 million, Hb 4.27 grammes, mean corpuscular diameter 8.12 $\mu$ . W.B.C. 3,125, neutrophils 62, lymphocytes 36, eosinophils 2 per cent. Indirect van den Bergh was moderately positive. reaction percentage marrow showed a high percentage of megaloblasts, two (of the 500 counted) were hæmoglobinized. Price-Jones curve was typically wide and showed a shift to the right.

Patient left hospital before cure was complete. Again did not report for maintenance treatment. Kept fit for three to four months but was seriously ill thereafter (the third time) with similar signs and symptoms. Was treated with liver injections in a district hospital and got relieved. In January 1941, he was admitted again to the Mayo Hospital with third relapse. Blood picture, other laboratory findings and therapeutic response were no different from those on previous admissions.

#### Discussion

#### (a) Nutritional Macrocytic Anamia

One of the two cases with splenomegaly was of the 'hæmolytic' type. Cases of N.M.A. complicated by splenomegaly have been frequently described and a 'hæmolytic' or 'complicated' subclass has been created for cases having positive indirect van den Bergh, higher than normal initial reticulocyte count and excess of urobilin in urine (Fairley et al., 1938; Napier, 1939).

The white cell findings were of interest because of the view that inverted polymorphonuclear: lymphocyte ratio is not noted frequently and that leucopenia is not common in the 'non-hæmolytic' variety of N.M.A. (Napier, 1939).

Two of the Price-Jones curves could pass closely for Addisonian anæmia, the three being symmetrical. These findings are at variance with the view that Price-Jones curve in N.M.A. does not usually show the wide base of Addisonian anæmia (Fairley et al., 1938; Napier, 1939).

In three cases indirect van den Bergh was moderately positive, in three it was negative and in one it was not recorded. Out of three indirect positive cases only one was complicated by splenomegaly, the other two cases having neither a palpable spleen nor a history of malaria. Urine in these two showed excess of urobilin. Gastric secretion in both confained free hydrochloric acid. Conjunctivæ were sub-icteric and skin of lemon yellow hue. In general terms it may be said that tinging of the skin and sclera occurs when the bilirubin in the blood reaches a concentration of 1 in 80,000' (Boyd, 1940). Interpreting these two cases in the line of this criterion the bilirubinæmia was comparable to Addisonian anæmia. Average mean serum bilirubin in Addisonian anæmia is  $0.98 \pm 0.06$ mg. per 100 cc. of serum (Mills and Mawson, 1938). This finding of hyperbilirubinæmia in cases of 'uncomplicated' N.M.A. apparently is most unusual. Wills (1931) would appear to believe it is never positive in such cases and she says '.... these findings suggest but no more that the increased hæmolysis which is a fundamental part of pernicious anæmia is absent in tropical macrocytic anæmia and this indicated that the two diseases have a fundamentally

different pathologic basis'. Napier confirmed this finding as he attributed his own and Fairley's cases where indirect van den Bergh was positive because of the associated chronic malarial splenomegalies.

A point of interest here in connection with the question of hyperbilirubinæmia in the two 'uncomplicated' (or 'non-hamolytic') N.M.A. cases was the comparison of the standard deviations of mean diameter, as determined by the Price-Jones curves, with those of the other three 'uncomplicated' cases showing no three 'uncomplicated' cases showing no hyperbilirubinæmia. These are 1.0500, 1.1446 0.7492 respectively 0.7367. 0.6547, and These are two significantly different groups which means that cases showing hyperbilirubinæmia had significantly greater anisocytosis than the other similar three cases with negative indirect van den Bergh reactions. Standard deviation in a Price-Jones curve is a measure of anisocytosis and in the above two cases it was as high as in an average case of Addisonian anæmia. This fact fits with the explanation put forward by Davidson and Fullerton (1938) and Napier (1939) for the hyperbilirubinæmia in Addisonian anæmia: '... the defective products of hæmopoiesis are readily destroyed by a relatively normal reticulo-endothelial system'. Napier further explains the lower level of blood bilirubin in N.M.A. by the observation that '.... though the cells are larger than normal there is less anisocytosis and poikilocytosis and therefore fewer cells to attract attention of reticulo-endothelial system and less hæmolysis'.

#### (b) Addisonian Anamia

The important question that arises from a consideration of the two case reports is that of diagnosis. Do the clinical and hæmatological features settle for all practical purposes that these were cases of true Addisonian anæmia, cases where the ætiological factor lay in the complete or relative absence of Castle's intrinsic factor?

Incontrovertible proof, of course, would have been a demonstration of absence of this factor but this was not carried out. However, on basis of clinical, hæmatological, therapeutic and follow-up features we were convinced these were cases of true Addisonian anæmia.

What are the features differentiating true Addisonian anæmia from N.M.A.?

Clinically consideration of age, economic stratum, nutritional state, diet consumed and a thorough search for coincident disease all render useful differentiating information. Nutritional anæmia is commoner in the young people because not only are the metabolic demands of young active people on nutrition high but also because it does not take four decades to bring out the evidence of unwholesome diet. Both the patients cited here were petty land-owners, well built, and ate excellent mixed Punjabi diets.

England, (ii) that the morbid process is less severe and more chronic and (iii) that the milk is more germ-free. Recently laboratory animals have also proved to be less susceptible both to the local culture and the imported cultures. Yet the earliest record (reduced from the ancient to the modern terms) of tuberculosis in animals in India gives the incidence in elephants in B.C. times.

Tuberculosis in poultry in India.—Very little is known about this morbid process in India. In England 'farm house' birds suffer more than 'poultry farm' birds. Obviously the cattle give the disease to the birds.

Histoplasmosis.—During the last few years this fungus disease has emerged as an entity. Among other organs it attacks lungs and the x-ray picture is suggestive of tuberculosis. The disease has been held to be fatal. Further, x-ray positive and tuberculin-negative cases have been proved recently to be cases of histoplasmosis by a skin reaction with a product of the fungus.

Furthermore, very recently benign cases of histoplasmosis have been described.

All these facts concerning histoplasmosis must be taken into consideration during the contemplated tuberculosis survey, and campaigns of immunization and treatment.

Some social considerations.—As in Sweden in the last century so in India to-day it is the country born and bred labourer who comes to die in the slums of towns. Greed brings him from the farm to the factory. Discomfort and insanitation of the slums give him the disease which kills him. He dies of several other diseases also. In dealing with him medical men should seek the help of social reformers. In fact the social reformers working alone will be much more effective than the medical men working alone. Incidentally the greedy labourer is likely to be tuberculin negative on arrival and should be the choice of the serologist for testing.

A poor man dying at home, back in the village, spreads the disease by massive infection. An ignorant man of means also spreads the disease in the same way. If the massive infection could be checked, small doses of even the virulent organisms might be tolerated and immunity produced. As a matter of fact that is what happens in the special village settlements. This scheme is worthy of consideration specially in India. Isolation of all the infected cases in sanatoria, in the usual way, will remain an impossible task for many years to come.

That the incidence of tuberculosis can be checked and that the declared disease can be brought under control comparatively easily have been amply demonstrated by Papworth Settle-

ment. Infected husbands and wives have bred children who have remained healthy. 'Of 151 children admitted in families with positive sputum, 37 presented no clinical or radiological evidence of tuberculosis; 101 showed evidence of past infection; 4 had juvenile tuberculosis and 9 developed pulmonary tuberculosis of the adult type (adult phthisis). All were ten years of age or over on admission to the settlement.' 'Of 108 children born in the village, as many as 55 presented no clinical or radiological evidence of tuberculosis; 53 showed evidence of past infertion. The findings of the years 1926, 1927, 1932 and 1933 already quoted are confirmed by additional years of experience. None of the village-born children (and more have now come of age) has, while a member of the community, contracted tuberculosis of the lungs, glands, bones or joints, or, indeed, in any known clinical form.' 'These are remarkable results.'

Psychological considerations in the treatment of tuberculosis.—The wage-earner is at his best while earning the wage. Arrangements should be made to rehabilitate him when he is afebrile. The Papworth Village Settlement families demonstrate the importance of such arrangements. Forces of immunity do not thrive in the flesh and blood of a depressed man.

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The correction of luteal insufficiency, manifested by habitual abortion, non-nidation of the ovum and menorrhagia, is effected most satisfactorily by injection treatment with progesterone. A full range of strengths of ampoules of solution in oil is available for this purpose as Progestin B.D.H. Ampoules containing I mg., 2 mg., 5 mg., and 10 mg., each in I ml., are issued.

In mild deficiency states and for supplementing injection treatment, tablets of

Ethisterone B.D.H. (5 mg. and 10 mg.) are issued for oral use.

Agreement has not been reached on the subject of the effect of progestogens on uterine motility but certain cases of spastic dysmenorrhæa appear to be relieved by progesterone. It is possible that the effect is dependent upon the cestrogen/progestogen ratio and thus upon dosage of progestin. There may therefore be considerable variation in the effective dose, even for individual patients.

Details of dosage and other relevant information on request

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#### Indian Medical Gazette

#### NOVEMBER.

#### CHLOROMYCETIN

This is the new antibiotic from a new strain of streptomyces, a mould like Penicillium notatum which yields penicillin and Streptomuces (Actinomyces) griseus which yields streptomycin. It was isolated by Burkholder of Yale University working with a team of the Research Laboratories of Messrs. Parke, Davis & Co., of Detroit, near Caracas, Venezuela (Ehrlich, Bartz, Smith, Joslyn and Burkholder, 1947). Streak cultures on agar of this mould inhibit, in their neighbourhood, the following :--

Brucella abortus.

Escherichia coli

Klebsiella pneumonia.

Mycobacterium tuberculosis (H 37 Rv).

Proteus sp.

Salmonella schottmuelleri.

Shigella paradysenteria (Sonne).

Staphylococcus aureus.

The active substance from a liquid culture was crytallized as a chemical which is unique in containing both nitrogen and non-ionic chlorine. It is stable and heat-resisting.

The crystalline substance showed a marked activity against Rickettsia prowazeki when tested in embryonated eggs and mice.

The toxicity for mice was low and the substance could be absorbed when given by mouth.

The effect on mice infected with scrub typhus was also satisfactory. Preliminary observation showed that the drug would be useful in tuberculosis and rickettsial infection (Annotation, 1947).

Treatment of cases of scrub typhus in Malaya gave 'most promising results ever achieved in human rickettsial infections' (Special Articles, 1948). So satisfactory has the treatment proved that 'the future history of the typhus group of disease will depend on how far the demand for chloromycetin can be met ' (Editorial, 1948a).

Results in louse-borne typhus and murine typhus have also been satisfactory (Editorial,

More details of the success of the drug and of its dosage, etc., have recently been given (Editorial, 1948c). After a single oral dose of 2 gm., appreciable amount of the drug was demonstrable in blood and serum within 30

minutes but disappeared by the end of 8 hours. Effective level can be maintained in the blood by 1 gm. given initially and followed by 0.2 gm. overy 4 hours. These doses have not produced any discomfort in physicians who volunteered for the test.

No recent observations on the treatment of tuberculosis by this drug appear to have been made. Low toxicity and oral route should make it the drug of choice. Probably its availability is in the way. If that he so then the question arises whether chloromycetin will be able to compete with para-aminobenzoic acid in the treatment of typhus fever.

What applies to tuberculosis applies to leprosy

No observations appear to have been made at all on the effect of the antibiotic on virus diseases which are closely related to rickettsial diseases and include rabies in experimental animals.

The daily press has become mould minded since the introduction of penicillin. Glowing accounts of chloromycetin have appeared in non-medical journals in America. The Calcutta press has followed suit (Daily Press, 1948).

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#### MEDICAL EDUCATION

Ir is proposed to publish articles on the above subject as a special feature in a future issue. Contributions in this connection will be received until the 28th February, 1949. Educationists, critics and others are expected to give their bestin this important subject.

## Medical News

NATION-WIDE SURVEY OF CHILD POSTURE AUSTRALIA UNDERTARES BIG TASK

By ELIZABETH DAWSON

(Reprinted from the Release No. P/957 of the Public Relations Officer, Australian High Commissioner's Office, New Delhi)

An interesting experiment is being carried out in Australia where a nation-wide survey of child posture is being made. It is believed that this is the first

time in the world that such a survey has been attempted. Up to the present, 35,000 children have been examined.

In October 1945, supervisors in physical education from the six States asked that the survey be made, so that there would be authoritative information available to those responsible for carrying out physical education and health programmes.

Representatives of the School Medical Services were also insistent that such a survey would be valuable, and finally the Federal National Fitness Council agreed to sponsor the undertaking.

Dr. Edith Clement, an officer of the New South Wales School Medical Services, was appointed to take charge of the work, together with a non-medical research officer. They were to determine the incidence of postural defects in school children, and to discover age trends. To make a worthwhile survey, it was decided that at least 25,000 children should be examined.

Obviously Dr. Clement would not be able to undertake the work alone, so the State Education Departments were asked to make available Physical Education Staff. Dr. Clement visited all the States, and conducted two-day instructional courses.

So that results would be uniform throughout Australia, Dr. Clement decided to use a series of photographs in her lecture to the Physical Education Staff. Children were photographed at the ages of 7, 10 and 13, and these photographs showed certain defects and degrees of defects. Children of different types of build were selected. Some were thin, others stocky, some short for their ages, others tall. In the early age groups, both sexes were combined in the sets of pictures, but for the 13-year-olds, different sets were made for each sex.

Because data were to be collected by lay observers, and with photographs for guidance, Dr. Clement decided to avoid technical terms, and concentrate upon certain common postural defects. Examiners were taught to look at the positions of the head and shoulders, the thoracic and lumbar spine seen in a lateral view, knock knee, overcarriage, and total posture. All deviations from the normal in these positions could be identified by photographs.

Children who have been examined were selected from both metropolitan and country, public and private schools, and ages ranged from 5 to 14. A survey of posture in toddlers had already been made by experts in the Lady Gowrie pre-school centres. There is one of these in each capital city.

Dr. Clement has already flown more than 7,000 miles on this work. Her headquarters are in Canberra, and she has been able to make a more intensive study of children in this city. She is especially interested in adolescent kyphosis, or bony changes in vertebræ, and has selected a group of older High School children for observation. X-rays have been taken of their spines, in addition to the routine examination. Later, Dr. Clement will examine a corresponding group in Sydney. These will be children who have left school, and are employed at one of the largest stores, or who are apprenticed to different trades.

So far, Dr. Clement has found an incidence of 3½ per cent kyphosis in adolescents, and she is hoping that at the end of the investigation she can reach some conclusion as to its cause and remedy.

Results from all States are still being tabulated, so that it is too early to report on the findings of the survey. When they are complete, a conference will be called of all State authorities, and it is hoped that some ruling can be given on certain types of exercise, such as strenuous toe-touching and that remedial exercises for different age groups can be evolved.

Dr. Clement made an interesting comment—'It is rare to find good posture together with a low I.Q.'.

THE THIRD SOUTH INDIAN PROVINCIAL MEDICAL CONFERENCE, MADRAS, 22ND OCTOBER, 1948

In his presidential address to the above conference Dr. P. A. S. Raghavan, L.M.P., Z.M.R.L., discussed the following points of interest to medical men in South India particularly:—

The progress of the provincial branch.

Inequalities in and the unification of medical services.

The Indian Medical Council.

Medical relief, State medical relief, State insurance and preventive measures.

Medical education including post-graduate and refresher courses and medical research.

The indigenous systems of medicine.

Medical industries,

Medical administration.

The duty of medical men.

THE THIRD INTERNATIONAL CONGRESS OF LIFE ASSURANCE MEDICINE. ROME, JUNE 1919

DEAR DOCTOR,

The Third International Congress of Life Assurance Medicine is announced to be held early in June 1949 at Rome.

Such a conference is a convenient platform from which to spread information, knowledge and recent progress made by the Medical Profession and Life Assurance Medical Examiners throughout the Indian Union in the Art and Science of Life Assurance Medicine. Such a congregation would usefully serve not only to give vent to our ideas on this important subject but would encourage the free flow and spread of knowledge both amongst our profession and the public.

'The subjects fixed for discussion at the Congress are:-

- 1. Medical Examination in Life Insurance; its difficulties and impediments.
- 2. Influence of heredity on mortality.
- 3. Cardiopathies and Life Insurance—
  - (a) Valvular defects; (b) Arrhythmias.
- 4. War Experiences with regard to Preventive Medicine.

With the steady and rapid rise of life assurance business in India the importance of proper medical examination, its technique and knowledge of recent methods, and the proper assessment of lives, have rapidly come to the forefront. In order therefore to stimulate an intensive study and research on this subject of vital importance in its different aspects, it is earnestly requested that all consultants and medical practitioners of the Union of India heartily co-operate to make this congress a success, and contribute their valuable quota of knowledge and experience by reading papers and forwarding communications to the undersigned at an early date, either on one or more of the subjects mentioned above, or on other subjects relating to Life Insurance Medicine.

This is the first time participation of Indian physicians and surgeons of India is solicited, and it is therefore very important that our country takes a prominent part, both by personal presence and scientific contributions, in the success of this congress. We also earnestly request Life Assurance Companies and Associations and Institutions connected with life assurance, throughout India, to extend their co-operation and support.

In order to be able to forward the papers, and communications in time for the Congress, it is requested that the same may be forwarded to:

DR. KHURSHED J. J. CURSETJI, Oriental Life Assurance Co., Ltd., Oriental Buildings, Post Box No. 148, Fort, Bombay 1.

on or before 31st January, 1949.

It would be of assistance if you would kindly advise us in advance of the title of your subject.

Thanking you in anticipation for an early and favourable reply.

Yours sincerely, M. D. D. GILDER, KHURSHED J. J. CURSETJI, Members of the Permanent International Committee for the Study of Life Assurance Medicine.

BOMBAY, 24th September, 1948.

#### LIKELY VACANCIES FOR INDIANS UNDER WORLD HEALTH ORGANIZATION

A Note dated 15th January, 1949, from the Piess Information Bureau, Government of India, states there are possibilities of well-qualified Indians being appointed to the steff of the World Health Organizaappointed to the staff of the World Health Organiza-tion during the coming one or two years. Vacancies for specialists in maternal and child health, tuberculosis, malaria, venereal diseases control, nutrition, environmental hygiene, sanitation, etc., are likely to occur under the organization. The posts are likely to carry under the organization of the posts are likely to carry salaries ranging from \$5,000 to \$7,000 per annum. There may be one or two positions for highly qualified and more senior individuals at Director or Assistant Director level. There will also be a few positions for doctors well qualified in general public health and a few in non-medical administrative and financial services. Only a small number of these appointments will be made in the immediate future.

Candidates desirous of seeking employment under the World Health Organization are required to send their applications containing full particulars of their qualifications and experience to the Director-General of Health Services, New Delhi, not later than 15th February, 1949.

#### LIVER EXTRACT

Journal, Pharmaceutical the from (Abstracted 22nd May, 1948, p. 361)

THE early excitement which followed the synthesis of folic acid has died down and this is, it is said, due in some measure to the fact that in clinical trials this compound has not fulfilled the hope that it would entirely replace liver extract in the treatment of pernicious anæmia. To-day folic acid is used as part of the treatment of this condition and some form of liver preparation must be used as well. Since the war-time ban on the production of liver extract for oral use has been lifted, doctors have again had the choice between injection and oral preparations. The latter have the

advantage of simplicity, but the flavour is not always conducive to long continued use. Proteolysed liver preparations, which incidentally did not come within preparations, which medicinary that it is alleged, more potent war, are more palatable, and, it is alleged, more potent was a supply a supply of the property war, are more paratable, and, it is anleged, more potent than extracts prepared by alcohol extraction. The latest development in this subject is represented by the isolation of a fraction which is active in a dose of 03 mg. or less; while it may, at the moment, be of academic interest only, it brings us a stage nearer a solution of the identity of the active principle of liver. It has been suggested that this is one of the substances that can be produced by microbiological agencies in the same way that nicotinic acid, vitamin K and other vitamins are produced by bacteria. Whether this is so or not-and the idea is pure speculation—the discovery of vitamin B₁₁, as it has been called, is another triumph of systematic research in which chemists, biologists and physicians have collaborated.

### LEPROSY TRAINING COURSE

THE Honorary Secretary, The British Empire Leprosy Relief Association (Indian Council), has informed all Provincial and State branches that it is proposed to hold the next Leprosy Training Course at the School of Tropical Medicine, Calcutta, from 14th February to 12th March 1949 provided sufficient number of 12th March, 1919, provided sufficient number of candidates is forthcoming. The selection of candidates will be made by Dr. Dharmendra, Officer in Charge, will be made by Dr. Dharmendra, Officer in Charge, Leprosy Research Department, School of Tropical Medicine, Calcutta. It is therefore requested that names of candidates may be submitted direct to him on the enclosed application form which should reach him by the 15th of January next.*

#### SYLLABUS

- 1. Lectures.-A course of 20 lectures covering the actiology, clinical manifestations, classification, diagnosis, differential diagnosis, course, pathology, bacteriology, epidemiology, treatment and control of leprosy.
- 2. Demonstrations.—The demonstrations will cover the following subjects: clinical examination, case charting, bacteriological examination, diagnosis, differential diagnosis and method of treatment.

Histopathology, the leptomin test, methods of survey, and chemistry of the preparations used in the treatment.

- work.—Clinical and bacteriological examination of cases, case charting, treatment.
  - 4. Tutorial classes.
- 5. Examination.—At the end of the course a practical and theoretical examination will be held, and certificates will be given to the successful candidates.

### ANTI-ANÆMIC SUBSTANCES FROM LIVER

(Abstracted from the Lancet, 5th June, 1948, p. 876)

Mr. E. Lester Smith, p.sc., of Glaxo Laboratories, has crystallized the anti-pernicious anæmia factor which he has isolated from liver. In a report to the Biochemical Society's meeting, he said that the crystals obtained resemble those of vitamin B, as illustrated by the American workers.

^{*} Received too late for inclusion in an earlier issue. This delayed issue is appearing after 15th January, 1949.—EDITOR, I.M.G.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
TIME-TABLE OF FORTHCOMING SCIENTIFIC AND TECHNICAL CONFERENCES
Compiled for the Working Party of the Standing Committee of the British Commonwealth Scientific Official
Conference

	Con	ference Dittish Commonwealth	Scientific Official	
Date of conference	Title of conference	Name of convening body	Place of meeting	
1949 Jan	Winter Mastin	District Control		
2nd to 23rd Feb.	Winter Meeting 7th Pacific Science Conference	British Grassland Society Royal Society of New Zealand	Newcastle. Auckland and	
8th Feb. onwards	International Civil Aviation Organ- ization, Air Line Operating Prac- tices, Operations Division.	International Civil Aviation Organization.	Christohunak	
22nd Feb. onwards	International Civil Aviation Organization, Airworthiness Division.	International Civil Aviation Organization.	Montreal.	
16th May to 3rd June.	U.N. Scientific Conference on Con- servation and Utilization of Re- sources.	ECOSOC	U.S.A.	
May	International Railway Congress	International Railway Congress Assoc., Brussels.	Lisbon.	
July 9th to 23rd July (proposed). 21st to 29th July	Summer Meeting 4th Empire Mining and Metallurgical Congress. 2nd International Congress of Crop Protection.	British Grassland Society Empire Council of Mining and Metallurgical Institutions.	S.E. England. London and Oxford. London.	
July	Commonwealth and Empire Conference on Tuberculosis.	National Assoc. for the Prevention of Tuberculosis.	London.	
Summer	Congress of Psychotechnics	National Institute of Industrial Psychology.	Berne.	
15th to 19th Aug. 19th to 25th Aug.	12th International Dairy Congress 1st International Biochemical Con- gress.	International Dairy Federation	Stockholm. Cambridge.	
31st Aug. to 7th Sept.	British Association for Advancement of Science Annual Meeting.	•••	•••	
Aug. and Sept	Specialist Conference on Plant and Animal Nutrition in relation to Soil and Climatic Factors.	Council for Scientific and Industrial Research (Australia).	Australia.	
6th to 10th Sept. 14th to 16th Sept.	15th General Conference General Assembly	International Union of Chemistry International Council of Scientific Unions.	Amsterdam. Copenhagen.	
Oct	The 5th International Animal Hus-		Paris.	
Undecided	bandry Congress (Zootechnical).  3rd International Conference on the	Bureau of Standards	Washington.	
Undecided	Chemistry of Cements. Conference on Cosmic Rays	Cosmic Ray Commission of the International Union of Physics.	Europe.	
Undecided	6th International Congress on Radiology.	***	London or Cambridge.	
Undecided	5th International Grassland Congress.	•	Netherlands.	
1950	Date and Programme not yet fixed	}	Holland.	
Aug	4th International Congress of Soil Science.	1		
30th Aug. to 6th Sept.	International Congress in Mathematics.	•••	Cambridge, U.S.A. U.S.A.	
Undecided	3rd Pan-American Mining Engineer- ing and Geology.	•••	Copenhagen.	
Undecided	18th International Congress of Physiology.	International Union of Historical	•	
Undecided	International Congress of History of Science.	International Union of Historical Sciences. International Union of Biological		
Undecided	General Assembly	Sciences.	London.	
July	4th Plenary World Power Conference.	International Union of Biological		
Undecided	5th International Congress	Sciences. International Union of Biological		
·	7th International Botanical Conference.	Science. British Assoc. for the Advancement		
	British Assoc. Annual Meeting	of Science	London.	
Undecided	International Congress on Ophthal- mology.	Commonwealth Agricultural Bureau		
Undecided	Commonwealth Agricultural Bureau, Review Conference.	•		
1951	4th Congress of Large Dams	International Commission on Large I Dams of World Power Conference.		
Sept	12th Congress and 16th Conference	International Union of Chemistry	Vashington and New York.	

#### Public Health Section

#### A STUDY ON THE HEALTH HABITS OF A RURAL COMMUNITY IN WEST BENGAL IN THE MATTER OF MEDICAL RELIEF WITH SPECIAL REFERENCE TO THE UTILIZATION OF FREE MEDICAL SERVICE

By R. B. LAL and S. C. SEAL

All-India Institute of Hygicne and Public Health, Calcutta

THE world trend, at the present time, is towards the assumption of greater and greater responsibility for the health of the people by the governments. The announcement recently made by the Australian Health Minister on the health policy of the Australian Government (Bhore Committee, 1946) typifics this trend.

'For the people are necessary-

The knowledge that they may, as their right, require from the government such medical and hospital services as they really need without the humiliation of proving their financial status, or the bitterness of accepting charity.

The knowledge that the breadwinner will not have to face a crippling bill for hospital and medical services if he, or any member of his family, suffers a prolonged illness.

It is intended, although this stage has not yet been reached, that every person shall have the right to receive medical advice from a doctor whenever he is ill and without any cost to himself. This will apply in the case of every Australian citizen, including women and children, and will not be limited by any consideration of the financial status of the patient'.

While in Australia the stage visualized in the last paragraph has not yet been reached, the British Government have already launched on such an experiment. Following this trend the Bhore Committee's recommendations for this country aim at the establishment of a network of hospitals and dispensaries as close to the people as possible, particularly in rural areas. Indeed, considering the amount of poverty, sickness and the difficulty in procuring the right type of medical treatment the need for governmental organization for medical relief would appear to be more imperative here than in the more advanced countries. The Committee recognize the difficulties arising out of the paucity of funds and of qualified personnel but they courageously go forward in working out a detailed plan in pursuance of this objective. The Committee's recommendations have caught the imagination of the health authorities and the

various local governments are trying to find ways of implementing them to the extent that their means would permit.

Leaving aside the administrative and the technical implications of this policy it must be recognized that we are dealing here with essentially a social problem as applied to a specialized field; that is to say, that the socioeconomic situation of the community is a major factor in its successful working and also the results which might accrue from the operation of a plan based on that policy will have, in their turn, repercussions in the wider sociopolitical arena. The question, therefore, arises whether this proposition would be applicable to all and varied socio-economic circumstances of communities and whether in the absence of a highly developed political consciousness, the assumption of greater and greater responsibility for people's health by the State would not lead to less and less owning of responsibility by individuals. The answer to this question, in respect of our own country, could only be furnished by actual experience but the danger is that once the scheme has been adopted there can be no going back, irrespective of results and, therefore, a careful consideration from the social point of view, at this stage, is all the more necessary.

Another social aspect of the problem is the extent to which our rural population would make use of the free hospital and dispensary service, because, however beneficent the intentions may be, they have to be recognized as such by the would-be beneficiaries, if any success is to be achieved. In case this recognition is lacking, the reasons for the same, some of which may have considerable validity, must be discovered through objective study, and removed, as far as possible.

Our studies at Singur furnish some information on the habits of the people with regard to the medical treatment in case of sickness and the factors which influence them. The discussion that follows is based on the material collected in the course of a general health survey (Lal and Seal, 1947). Properly to appreciate the situation, it is necessary to recount certain relevant features of this community.

Singur Health Centre Area comprises 4 union boards, situated 21 miles from Howrah. It is well connected by the railway system and about 2 per cent of the population travels daily to and from Calcutta. The internal communications are fairly good for this part of the country. Besides the railways, which cover a good part of this area, there is not much difficulty in travelling from place to place on foot, by bicycles, by bullock carts and in certain parts by motor cars, except during the rainy seasons

when some villages are not easily approachable. The total area is 32.98 square miles and the population is 62,736, the density per square mile being 1,900, which is inordinately high for a rural area. Eighty per cent of the land is under cultivation which supports 83 per cent of the population; 9 per cent of the people follow arts and trades. There are no industries, in the area, worth the name. Only 6 per cent of the population depends on industries, mostly railway workshops and other factories in Howrah suburban areas. A little over 2 per cent of the people follow liberal professions. However, being so near the metropolis and economically dependent upon it, the people are relatively less conservative than residents of distant villages. Even so, political consciousness is not well developed, because 71 per cent of 1,173 families investigated, have essentially individualistic outlook. Only a small minority of 0.5 per cent exhibit highly socialistic outlook. The attitude of the rest is more or less balanced.

Literates constitute one-fifth of the total population and one-fourth of persons above 10 years. Of the latter, 43 per cent of the males but only 5 per cent of the females are literates. Average annual expenditure on the consumption side is only Rs. 165 per head of population of which Rs. 148 go towards food. Of the remaining, Rs. 2-8 are spent on private medical relief. This represents 1.5 per cent of the total expenditure on the consumption side and it is exceeded only by expenditure on food, clothing and fuel.

Birth rate is 42.6 and death rate is 23.7 per mille. Infant mortality is 137. Net production rate is 1.13. As many as 38 per cent of the people are sick at least once a year. The total number of sick persons during the year is estimated at 23,889. Judged by the local standards, on an average 12 per cent of the population is 'unwell' at any time, 1.1 per cent being acutely ill, 2.1 per cent chronically ill and 8.4 per cent in indifferent state of health. An average of 18.4 days per head of population is lost through sickness. Malaria, measles, dysenteries and diarrheas; other fevers, typhoid, paratyphoid, influenza and pneumonia, cholera, asthma, chicken pox; and skin diseases are the main causes of sickness in order of importance. Hæmoglobin is below 75 per cent in 80 per cent of the population but the spleen rate is only 18 per cent. Incidence of hookworm infection is roughly 45 per cent. In short, the population though rural in character is under the social and economic influence of Calcutta and suburban areas, density is high, economic conditions are low and health is poor.

Official medical relief, exclusive of purely public health services, is administered through an 18-bedded hospital with an outdoor department, an emergency 20-bedded hospital and 3 outdoor dispensaries, one in each union board, except Singur where the hospital is situated. The latter is under the charge of a medical

graduate, assisted by a compounder cum dresser and a nurse. The other dispensaries are under the charge of wholetime medical licentiates helped by compounders. There is a 4-bedded maternity home attached to the Singur Health Centre. Excluding the maternity and emergency hospitals the total budget for these institutions amounted to Rs. 8,882. In addition to the 4 doctors in charge of the hospitals and dispensaries there are 9 qualified and 48 unqualified practitioners including 1 ayurved and 16 homeopaths.

If every sick person were to avail of medical care at public dispensaries at least 72 such dispensaries would be required provided each of them treated 100 cases a day and worked all the 365 days in the year. Leaving aside persons in indifferent state of health, 20 dispensaries will have to be established to cater for the acute and chronic patients only. Actually the work will be very much heavier on account of concentration of cases in certain seasons. As against this calculation, even the three dispensaries and the Singur Hospital which are operating in the area are not working to their full capacity, because the average daily attendance per institution is 51 including old cases and at least half the beds in the hospital remain unoccupied. Accurate information regarding the emergency hospital is not available but assuming that all the beds remain fully occupied all the time, the total number of patients using the hospitals and dispensaries daily would not exceed 53. Since at the outdoor dispensaries medicine is dispensed for 2 days at a time we may add 204 to this number for calculating total persons under treatment. In other words, only about 1|5th of the acute and chronic cases or 1|17th of the 'unwell' population may be estimated as utilizing the official services for medical relief. What could be the reason? There can be many guesses but the answer could only be given by an actual enquiry.

In planning our survey we did not envisage a discussion on the extent of utilization of the official medical relief and, therefore, no direct enquiry on this point was made but the schedules included information on a number of points, which permit of drawing fairly correct For instance, inferences in most instances. information was recorded as regards the nature of disease and the availability or otherwise of symptomatic and specific treatments in the village, within 5 miles of it and at the headquarters, the nature of medical attendance, the distance of the village from the nearest dispensary, the nature of communications, the age and sex of the patient, acuteness of the disease, educational standard, economic status of the family and availability of persons who may take care of the patient and arrange for visits to the dispensary, etc. Out of 157 patients investigated, in 63 instances in which the available data were considered inadequate for

drawing inferences, a supplementary enquiry was made to remove obscure items. This permits us to discuss the problem with a reasonable amount of confidence.

It is commonly assumed that the main hindrance in the way of provision of medical relief by qualified practitioners is finance. In the present case we find that only 1/17th of the population in need of medical relief is being served by the dispensaries at an annual expenditure of Re. 0-2-9 per capita. If a similar provision, whatever may be its worth, were to be made for the rest of the 16/17th 'unwell' population the additional expenditure would be Rs. 1,42,112. Actually the money spent by the people on private medical relief amounts to Rs. 1,56,840. So, if the whole amount were spent through the official agency, there should be no difficulty on financial grounds in catering for medical relief to every sick person. Obviously other and more important reasons come in the way.

It will be seen from table I that 40 per cent of cases are not having any medical attention and a little more than that proportion are being

treated by unqualified practitioners. Only 29 patients or a little over 18 per cent are under Further the care of qualified physicians. investigation elicited the important fact that not more than 9 or 1/17th of the cases of these were receiving treatment at the free* public dispensaries. An interesting fact brought out by the table is that compared to children and old people a larger proportion of adults adolescents remain untreated. Children figure prominently amongst the clients of unqualified practitioners. Thus the adults and adolescents ignore their treatment more frequently than others and advice by unqualified persons is more often sought in diseases of children.

Sex distribution of cases according to the nature of medical attention is given in table II. Patients of the two sexes may be differentially influenced by their mobility, so this factor has

Table I

Distribution of patients according to age and medical attention (expected numbers are given in brackets)

Nature of medical					1	Age in	years							Per
attendance	-1	-5	-10	-15	-20	-25	-45	-50 -	-55	-60	-65	65+		cen
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No medical attendance Unqualified Qualified	3	9 (10 8) 13 (11.2) 5 (5.0)	(8.4) 10 (8.7) 7 (3 9)	3 (5.2) 7 (5.4) 3 (2.4)	7 (4.4) 4 (4.5) (2.0)	5 (3.6) 3 (3.7) 1 (1.7)	24 (18.4) 14 (19.0) 8 (8.5)	(1.2) (1.2) (1.2) (0.5)	2 (2 0) 1 (2.1) 2 (0.9)	3 (2.8) 4 (2.9) (1.3)	4 (2.4) 1 (2.5) 1 (1.1)	1 (2.0) 3 (2.1) 1 (0.9)	63 65 29	40.1 41.4 18.8
Γotal	4	27	21	13	11	9	46	3	5	7	6	5	157	

Distribution of patients according to sex, medical attention and ability to move about (expected numbers are given in brackets)

Nature of medical attendance		M	ALE		Female			BOTH SEXES		
		Ambulatory	Non- ambulatory	Total	Ambulatory	Non- ambulatory	Total	Ambulatory		Total
No medical tendance. Unqualified Qualified	at- 	41 (30.9) 25 (31.9) 11 (14.2)	(12.0) 15 (12.4) 9 (5.5)	47 (42.9) 40 (44.3) 20 (19.8)	13 (14.8) 16 (15.3) 8 (6.8)	3 (52) 9 (5.4) 1 (2.4)	16 (20.0) 25 (20.7) 9 (9.2)	54 (45.7) 41 (47.2) 19 (21.0)	9 (17.2) 24 (17.8) 10 (7.9)	63 65 29
Total		77	30	107	37	. 13	50	114	43	157

^{*}The dispensaries are run by the Local Authority (District Board). Medical advice and medicine are given practically free irrespective of the economic status of the patient, only a token charge of one pice (one quarter of an anna or one-sixty-fourth of a rupee) is made from new cases only.

also been considered here. It will be seen that the treatment of women is by no means neglected. On the other hand, contrary to expectations, the ambulatory male patients remain unattended more frequently than the corresponding group of females. However, the latter frequent the unqualified practitioners more often than the male patients do. In this connection one might bear in mind the cheapness of services of the unqualified practitioners and their availability nearer home. However, these facts do not exclude the possibility of greater credulity of women for quack treatment being a factor. We shall refer to this question when we consider the association of treatment by qualified practitioner with literacy.

Probable mildness of ambulatory cases would explain their remaining unattended more frequently than_the non-ambulatory ones. But if that be the reason, one would come to the conclusion that severe and mild cases are attended to by qualified and unqualified practitioners in about equal proportions. It is possible that the easier availability of the latter compensates for any greater confidence that the former might

inspire.

An analysis of the nature of medical treatment by diseases is given in table III. The figures are much too small to permit comments but in general it may be seen that some sort of medical consultation is sought in diseases which are either acute or painful and that the least attention is paid to chronic illnesses, like hookworm, leprosy, tuberculosis, kala-azar, heart disease, piles, etc. In other diseases the patients are divided more or less equally amongst the attended and the unattended. This inference holds true for ambulatory cases as well as for non-ambulatory cases so that in these cases question of transport and other difficulties is of minor importance.

The other important factors which may influence the choice of medical attendant are education and economic conditions. Ignorance has always come in for blame for all social evils. Our analysis confirms this popular notion to a large extent. Of the illiterates much fewer than the expected number seek qualified medical advice while proportionately a larger number remain unattended. Amongst the just literates the position is reversed and proportionately large numbers prefer treatment by qualified practi-tioners. On the other hand, amongst better educated persons advice of qualified practitioners is more often sought but the number remaining unattended is about the same as the expected. It is reasonable to expect that economic condition may be linked up with the educational standard and therefore further analysis is necessary. We shall revert to this question after a brief discussion of the inference of economic factor on medical relief.

The economic schedules were not filled for all the families. The information is available for 62 patients only. There are two factors involved in the economic status, namely, the scale of living as judged by the level of consumption expenditure and the stability at that level.*

TABLE III

The influence of the nature of disease on medical attention (qualified or non-qualified) in ambulatory and non-ambulatory cases

	Majority under treatment	Single cases which are under treatment	Half or more of the cases under freatment	None or only a few of the cases under treatment
Ambulatory	Gastric ulcer Cholecystitis Paralysis Scabies	Burn Diabetes Leucorrhœa Rheumatism Other respiratory disease Enlarged prostate	Chicken pox Diarrhœa Dysentery Eye disease Nephritis Pneumonia Asthma Bronchitis Malaria	Hookworm Leprosy Tuberculosis Kala-azar
Non-ambulatory	Typhoid Puerperal sepsis Rheumatism Measles Pneumonia Diarrhœa and dysentery	Otitis media Smallpox Syphilis Bronchitis Tuberculosis	Fever Malaria Abscess	Heart disease Influenza Mumps Piles Eczema

^{*}For details see Final Report on General Health Survey of Singur Health Centre, page 94, or Philosophy of Public Health (Lal, R. B.—Science and Culture, XI, 1945-46, p. 496). Briefly stated economic status is determined by recording the expenditure item by item, distinguishing between the expenses on the consumption side from those on the production side. The families are divided into three equal groups I, II and III according to their per capita consumption expenditure. Each of these groups is further divided into 5 sub-groups, a, b, c, d and e. In the first sub-group are included those families that are able to lay by over 15 per cent of their total income. Sub-group b consists of families whose credit balance lies between 5 and 15 per cent. Sub-group c can just balance their budget. Families of d and e groups have deficit balance.

With such a small sample it is not possible to determine the results of simultaneous operations of these two factors on the choice of medical attendance, but taking them separately interesting results have been obtained (see tables IV and V). In the first place it will be seen that the difference between the proportions of unattended patients in the groups belonging to the highest and the lowest scale of living is not significant. However, as regards the choice of qualified and unqualified practitioners, there is a marked difference. Poor living is definitely associated with attendance of unqualified practitioners, but there is no such difference

between the average and above average families in this respect. On the other hand, economic stability is more closely associated with medical attendance. Thus, the people remaining unattended increase as the stability decreases and the difference from the expected number is fairly high in those whose minus balance amounts to over 15 per cent. In this connection, reference may be made to the discussion on the influence of economic factors on the people's habits regarding expenditure on medical relief in relation to expenditure on various other items (Lal and Mathen, 1948). Considering everything, it may be stated that

TABLE IV

Distribution of cases according to the nature of medical attendance and education (expected numbers are given in brackets)

Nature of med attendance		Illiterate	Just literate	Secondary and high	Total
No medical attendar Unqualified Qualified	ce	38 (31.2) 34 (32.2) 6 (14.6)	13 (19.2) 23 (19.8) 12 (9.0)	11 (11.6) 7 (12.0) 11 (5.4)	62 64 29
Total	••	78	48	29	155*

^{*}Information about two cases is not available.

Table V

Distribution of cases according to medical attendance and scale of living (expected numbers are given in brackets)

Nature of medical attendance						
			. I	II	III	Total
No medical Unqualified Qualified	attendance 		6 (6.7) 7 (83) 6 (4.0)	7 (7.4) 8 (9.1) 6 (4.4)	9 (7.8) 12 (9.1) 1 (4.6)	22 27 13
Total			19 '3'	21	22	62

Distribution of cases according to medical attendance and economic stability (expected numbers are given in brackets)*

(a)	(b)	(c)	1	<del>-</del>	Total
	1	1 (6)	į (d)	(e)	
2 (2.4) 5 (3.0) 0 (1.5)	2 (2.4) 4 (3.0) 1 (1.5)	7 (9.2) 11 (11.3) 8 (5.4)	4 (3.2) 3 (3.9) 2 (1.9)	7 (46) 4 (5.7) 2 (2.7)	22 27 13
7	7	26	9 '	13	62
	5 (3.0) 0 (1.5) 7	5 (3.0) 4 (3.0)	5 (3.0) 4 (3.0) 11 (11.3) 8 (5.4) 7 26	5 (3.0) 4 (3.0) 11 (11.3) 3 (3.9) 8 (5.4) 2 (1.9) 7 26 9	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

^{1944,} Government of India Press, Calcutta.

the scale of living is a matter of habit and tradition which does not increase the sensibility for medical relief during sickness. Treatment is equally ignored by all classes except where there is a pressing need for it. The difference is seen only in regard to the quality of medical attendance. Family-to-family variation on this item is only moderate. It would also appear that most families have to draw on the reserve for medical expenses; where the family is in debt the expenditure on this item is postponed. According to the analysis by the methods employed by Bowley, medical expenditure, though much needed, is a luxury compared to that on food, clothing and housing, which, as essential but unsatisfied needs, receive priority and urgency over it. Contrary to expectations, there is a fairly regular trend for attendance by

unqualified practitioners which increases with greater stability and *vice versa*. The figures being small no regular trend is observable for attendance by qualified practitioners.

Under these circumstances it would be natural to expect that free medical relief would be eagerly availed of and keenly appreciated, but it is not so. Why? The answer to this question should be of considerable importance in connection with all schemes for extension of free hospital and dispensary facilities.

Since both education and economic status have been found to play a part in determining the nature of medical relief and since it is reasonable to expect a linkage between the two factors, further analysis is necessary to determine the relative rôle of each. This has been carried out in tables VII and VIII. It will be observed

Table VII

Distribution of cases according to the nature of medical attendance, education and scale of living (expected numbers are given in brackets)

Nature of medi	al	77					
attendance		Education	· I	II	III	Total	
No medical attendance	e	Illiterate Just literate Secondary or High School	0 (4.9) 5 (1.8) 0	7 (5.4) 1 (2.0) 0	9 (5.7) 0 (2.1) 0	16 6 0	
Unqualified	• •	Total Illiterate Just literate Secondary or High School	3 (4.3) 3 (2.7) 2 (1.2)	4 (4.7) 4 (3.0) 0 (1.3)	7 (5.0) 2 (3.2) 2 (1.4)	16 6 0 22 14 9 4 27	
Qualified		Total Illiterate Just literate Secondary or High School Total	1 (0.6) 1 (1.2) 4 (2.1)	1 (0.7) 3 (1.3) 1 (2.4)	0 (0.7) 0 (1.4) 2 (2.5)	2 4 7 13	
		GRAND TOTAL	19	21	22	62	

Table VIII

Distribution of cases according to the nature of medical attendance, education and economic stability (expected numbers are given in brackets)

		Economic stability .							
Nature of medical attendance	Education	(a)	(b)	(c)	(d)	(e)	Total		
No medical attendance	Illiterate Just literate Secondary or High School	2 (1.8) 0 (0.7) 0	1 (1.8) 1 (0.7) 0	7 (6.7) 0 (2.5) 0	4 (2.3) 1 (0.9) 0	2 (3.4) 4 (1.2) 0	16 6 0 22 14		
Unqualified	Total Illiterate Just literate Secondary or High School	5 (1.6) 0 (1.0) 0 (0.4)	3 (1.6) 0 (1.0) 1 (0.4)	4 (5.9) 7 (3.8) 1 (1.7)	1 (2.9) 1 (1.3) 0 (0.6)	1 (2.9) 1 (1.9) 2 (0.8)	14 9 4 27 2 4 7		
Qualified	Total Illiterate Just literate Secondary or High School Total	0 (0.2) 0 (0.4) 0 (0.8)	0 (0.2) 0 (0.4) 1 (0.8)	2 (0.8) 2 (1.7) 3 (2.9)	0 (0.3) 0 (0.6) 2 (1.0)	0 (0.4) 2 (0.8) 1 (1.5).	13		
c7 .	GRAND TOTAL	7	7	26	9.	13 ⁻	62		

that none of the 11 educated patients remained without medical attendance. Of the illiterates it is the lower two economic groups that go without treatment. On the other hand, qualified advice is sought mostly by educated people and to a lesser extent by the just literates but in the former case the scale of living appears to have decisive influence. No definite trend can be made out amongst the clientele of unqualified practitioners with regard to scale of living or education, though amongst the illiterates some influence of the scale of living may be discerned, there being some evidence of inverse relationship.

Table VIII suggests a definite influence of education in 'group c', i.e. amongst those families that are just able to more or less balance their budget. In this group of 26 cases none of the four from the educated families remained unattended; only one sought the advice of an unqualified practitioner. On the other hand, more than half the illiterates remained unattended, some consulted unqualified practitioners and only a few went to qualified doctors. Again, amongst the just literates unqualified practitioners were most popular and though none of them remained unattended only a few consulted qualified doctors. More or less a similar trend is observable in the lowest two groups though here some of the just literates also remain unattended. In the first two groups the figures are too small for comments but it is strange that in this series none of the patients of the educated families belong to group (a) and only two belong to group (b).

From this discussion it may be surmised that improved economic status and particularly education is likely to increase the recognition and appreciation of scientific medicine.

Finally, an attempt has been made to specify the most probable reasons which determine the nature of medical attendance and particularly the non-utilization of free dispensary service in each case. Broadly speaking, these reasons may be classified as follows:—

- 1. Mildness of the disease, either actual or deemed to be so due to ignorance.
- 2. Little or no belief, either in western system of medicine or in the particular dispensary doctor.
  - 3. Frustration on account of
    - (i) no relief having been obtained by dispensary treatment

O

- (ii) no interest due to failure of social or economic life or to prolonged illness.
- 4. Neglect.—This may arise from (i) sheer laziness or (ii) stoic outlook on life or (iii) age or sex, for instance, sickness of women or of children may not be taken as seriously as warranted.
- 5. Economic.—This may give rise to difficulties in connection with (i) transport problem and (ii) loss of business or wages.
- 6. Absence or inability of guardian or helper who may accompany the patient.
- 7. Treatment may not be available in the village or within a reasonable distance.

The relevant information regarding the 157 cases investigated by us is set out in table IX.

It will be at once seen from table IX that at least in the community under consideration the much-advertised aversion to western system of medicine amongst rural population is but a very minor cause. The most important reason is

Table IX

Distribution of cases according to the most probable reason for not seeking qualified medical advice, considering each investigated case individually

			No BELIEF IN		FRUSTRATION ARISING FROM		NEGLECT ARISING FROM		Economic difficulties				.:
Nature of medical attendance	Actual	Imagined	Western medicine	Particular dispensary	No relief	No interest in life	Sheer laziness	Age or sex	Transport	Cannot afford qualified attendance	Pressure of work	No guardian or helper	Total
No medical attendance Percentage	4 63	8 12.7	0	7 11.1	17 27.0	2 3.2	2 3.2	8 12.7	8 12.7	4 63	3 4.8	0	63
Unqualified Percentage Total	12 18.5	10 15 4	2 31	2 3.1	7 10.8	1 15	0	3 46	11 16 9	5 7.7	9 13.8	3 4.6	65
Percentage	16 12 5	18 14.1	2 16	9 7.0	24 18.7	3 23	2 16	11 86	19 14.8	9 70	12 9.4	3 2.3	128

frustration arising out of failure of the qualified practitioners to give relief to the patients. Some of these dissatisfied cases are driven to seek relief from unqualified practitioners but the majority give up the treatment altogether. Probably the latter include some of the failure of the unqualified practitioners also. An allied cause is the lack of confidence in the local dispensary. These two causes put together account for more than one-fourth of all cases not seeking qualified medical advice. By reference to the schedules of these patients it has been found that most of the cases are either too advanced for effective treatment by the local practitioners, whether qualified or unqualified, or they are intractable in nature, such as leprosy, tuberculosis, asthma, subacute nephritis, chronic bronchitis, congenital heart, intestinal colic, leucorrhea, piles, paralysis and chronic malaria.

The next important cause is the mildness of disease which accounts for one-fourth of the cases not treated by qualified practitioners. Of the actually mild cases a small percentage remain unattended but a majority seek unqualified medical advice which may be considered as a harmless practice, but it is a serious matter that quite a large percentage of the so-called mild cases which remain unattended or go to the unqualified practitioners are those in which the gravity of the disease has not been recognized due to ignorance and who evidently are not seen by qualified practitioners till they are in advanced stages, and therefore difficult to reclaim. Inability to pay for transport charges induces many patients to seek unqualified advice nearer home or to remain unattended. Another economic cause, namely pressure of work and to a lesser extent inability to pay for a qualified doctor, forces them to go to the unqualified practitioners and in some cases to deny themselves of any treatment.

Negligence due to age or sex of the patient is another important cause for no medical attendance. But neglect due to laziness, lack of interest in life, helplessness or distance from the residence of a qualified practitioner are only minor causes.

A further supplementary enquiry to find out specifically the reason for not availing of free treatment at a dispensary from 63 patients, many of whom were under treatment of qualified doctors, revealed the fact that lack of confidence in the local dispensary was the principal cause which accounted for one-third of the cases (see table X). Next in importance came frustration due to no relief. These two causes together explained 54 per cent of cases. Transport difficulties due to economic reasons prevented nine or one-seventh of the cases from going to the dispensary. In three instances the patients were too ill to be removed. Actual mildness of the disease or wrongly underrating its gravity was responsible for not utilizing dispensary services in 6 cases. It is interesting to note that in 5 instances attendance at a free public dispensary was considered contrary to the family traditions.

From the facts and statements made in the foregoing paragraphs it is evident that the agricultural community under discussion, though enjoying material, educational and cultural advantages of proximity to the great metropolis of Calcutta, is normally living at the bare subsistence level. It is heavily in debt. Population

Table X

Distribution of cases according to the reason for not attending a dispensary as revealed through the special supplementary enquiry

	Мпл	NESS	No be	Lief In	Frust Aris	ING	ARIS	LECT SING OM		ONOMIC		lper	to be		
Nature of medical attendance	Actual	Imagined	Western medicine	Particular dispensary	No relief	No interest in life	Sheer laziness	Age and sex	Transport	Cannot afford qualified attendance	Pressure of work	No guardian or helper	Too serious to removed	Tradition	Total
	<del>V</del>	<u> </u>		1 2 2			<u> </u>		1	0	0	0	1	0	27
No medical attendance.	2	4	0	9	7	0	1	2	1		,	,	3.7		42.8
Pèrcentage	7.4	.14.8	••	33.3	25.9		3.7	7.4	3.7			••		4	16
Unqualified	0	O	2	2 12.5	1 6.2	0	0	1 6.2	8 50.0	0	0 ,	0	6.2	6.2	25.4
Percentage	••	••	12.5	1	5	0	0	0	0	0 '	0	0	5.0	20.0	20 31.7
Qualified Percentage	0	0	0	10 50.0	25.0	.,							j	5	63
Total Percentage	2 3.2	4 6.3	2 3.2	21 33.3	13 20.6	0	1 1.6	3 4.8	9 14.3	0	0	0	3 4.8	7.9	•••

density is inordinately high. Most families are individualistic in their outlook, so political consciousness is not well developed. Sickness rate is high and physical condition is poor. State provision for medical relief is hopelessly inadequate. Under the circumstances people themselves spend Rs. 2-8 per head to supplement the official medical relief but in fact the ratio between the two expenditures being 15:1, it would be more correct to say that the people are trying to help themselves with just a little bit of aid from the local government. private medical expenditure amounts to 1.5 per cent of the total expenditure on the consumption side. It is incurred by the people because it cannot be helped but this is about the limit, for, it is mostly drawn from the savings, if any, and the other unsatisfied but essential items claim urgency and priority. Even so, most people have to be content with no medical attendance or with treatment by unqualified practitioners. This is not because they have no faith in scientific medicine but mainly because they fail to receive relief from the public dispensaries or local medical practitioners. It is for that reason that the former are working to half of their capacities and 22 per cent of the patients would wish to get expert treatment elsewhere if it were available. In this respect the better type of dispensaries and the system of secondary, district and special hospitals put up in organic relationship with the primary centres, as suggested by the Bhore Committee, should prove helpful. Whether or not the provision actually made at the higher types of institutions would be quantitatively sufficient to meet the situation would depend upon local circumstances. In the present case the number of beds to be constantly occupied at the various institutions by the patients who failed to get relief locally will be 234 or a little less than 4 beds per thousand of population against the provision of one bed per thousand population at the end of 10 years made by the Committee.

Another important reason brought out in this discussion is the real or supposed mildness of disease. The Bhore Committee are alive to this important matter and possibly the scheme of domiciliary treatment would help to bring relief to some of these cases and to a number of those who are unable to go to the dispensaries for various other reasons like transport, inability to move, age or sex, etc., mentioned above. But the staff provided by them will prove utterly inadequate in a population where 3.2 per cent are suffering from acute and chronic diseases and another 8.4 per cent are otherwise 'unwell'.

This again brings us to the question of finance. The per capita cost of the primary unit including its share of beds in 30-bedded hospitals on the basis of population served by it amounts to Rs. 2-10-10 (Report of the Health Survey and

Development Committee, 1946*) which is almost exactly equivalent to the combined public and private expenditure incurred at present medical relief by this community. We have already seen what benefit they derive from the way they are spending this money now. In the hypothetical event of their agreeing to put all this money in a pool and jointly administering it, they may choose between two alternatives. They may, as we have seen previously, extend the type of dispensary service which they have at present so as to include every 'unwell' person or they may for the same money adopt a plan after the manner of that part of the Bhore Committee Scheme which relates to the primary units and 30-bedded hospitals. In the latter case the number of dispensaries will be reduced to one-third of what they have now, a small number of patients will receive better dispensary besides some rudimentary treatment, and maternity and sanitary services, about one and a half times the number of hospital beds and a certain amount of domiciliary treatment will become available to them.

These three propositions are basically different. The first represents laisser-faire method, the other two are socialistic approaches but the difference is this that in one the service is of poor quality but universal, in the second, services of a better type concentrated on a small number. The advantages and disadvantages of the second proposition are obvious but in support of the first proposition some people may argue that with the progressive development of cheap and non-toxic chemotherapeutic agents treatment does not need fully trained but expensive doctors, if the community cannot afford their services for all. It is not for us to say which of proportions the people should or would elect but at any rate we may conclude with a warning quotation from John Stuart Mill-'Where the object is to raise the permanent condition of a people small means do not merely provide small effects, they produce no effect at all'.

#### Summary

1. A brief sketch of the socio-economic structure, stage of political development, health conditions, private medical practice and official administration of medical relief for a rural community in West Bengal has been given.

^{*}For purposes of this calculation, we have taken Rs. 1.47,19,54,477 (see Vol. III, page 263, of the Report) which is the annual average, for the first ten years, of the sum of the recurring expenditure on all the primary units and the 30-bedded hospitals to be established in the country. This amount divided by 108 × 508,000, that is the total number of 3 million units multiplied (see table in Vol. II, page 50) by the average number of people served in a year in one unit, during the first 10 years, gives the cost per capita. From the table given in Vol. III, page 253, it can be easily seen that an average of 17 beds will be available for each primary unit in 30-bedded hospitals.

- Habits of the people regarding treatment during sickness have been studied and discussed against the socio-economic background.
- Reasons for not seeking qualified medical advice in a vast majority of cases, and specially for non-utilization of free public dispensaries have been studied and discussed.
- 4. The services, which the community might obtain by adopting two different plans, costing an amount equivalent to private and public funds now being spent on medical relief, have been compared.

#### Conclusions

- 1. Although a rural community, the population of Singur is distinctly under the educational, cultural and economic influence of the great metropolis of Calcutta with which it has adequate communications.
- 2. Economic conditions are unsatisfactory, political consciousness is not well developed, health is poor and public medical relief is quite inadequate even though it is quantitatively but not qualitatively in advance of Bhore Committee's recommendations for a primary unit organization at the end of first ten years' period.
- The ratio of qualified medical practitioners to population is 1:5,000 which is higher than in the rest of the country. The community supports a still larger number of unqualified practitioners and also an ayurved and some homeopaths.
- Less than one-fifth of the patients seek qualified medical advice, of the rest about half remain without any medical attention and half consult unqualified practitioners. Dispensary service is utilized by only a small minority.
- 5. As may be expected, education, age and sex, nature of illness, scale of living and economic stability all enter into the question of medical attention and of the choice of medical attendant. Extension of education and improvement of economic conditions will increase the demand for qualified practitioners.
- Lack of belief in scientific medical system is a negligible cause for not seeking qualified medical advice; the principal cause is frustration due to failure of treatment. Mildness of disease, which in a majority of cases is due to underrating its gravity through ignorance, is the next important factor. Other causes in order of importance are inability to afford transport charges, pressure of work, age or sex and not confidence in local dispensary. Amongst the minor causes are no guardian or helper, no interest in life and charge largery. interest in life, and sheer laziness.
- Why vast majority of people do not make use of free medical treatment in the dispensaries is largely due to lack of confidence in them. This may arise from previous experience or treatment has actually been tried but without

- Expenses involved in transport is results. cause of some importance. another reasons are family tradition, mildness of disease mostly misjudged, patient too serious to be removed, age or sex, no belief in western medicine and sheer laziness.
- Public expenditure on medical relief is nominal. People spend 15 times that amount on their own account. This represents 1.5 per cent of the consumption expenditure or 15 per cent of what remains after paying for food. They cannot afford to spend any more on this item because food, house rent and clothing claim priority and urgency, and because money spent on medical relief comes mostly out of reserves, in the absence of which there is hardly any way
- If in the hypothetical case of an amount equivalent to the private and public funds now spent on medical relief being made available for organized community effort, the choice would lie between quality and quantity of service. Following the part of Bhore Committee's plan which relates to primary units the community can receive a rudimentary public health service in addition to a somewhat better type of dispensary, hospital and domiciliary service, but in this case the dispensary provision will be limited to about 1/76th of the unwell population though about half as many more hospital beds will be available. On the other hand, if they were to remain contented with the quality of the present dispensary services with perhaps a liberal use of new chemotherapeutic agents for the treatment of common diseases, all unwell persons could receive treatment without appreciable increase in cost.
- The community has great possibilities of progressive improvement in the organization of medical relief from within, provided there is advancement in education, health consciousness, economic conditions and co-operative spirit or awakening of political consciousness. However, expert outside assistance will be required for the treatment of chronic or intractable diseases.
- These conclusions apply to the particular community under consideration or to similar communities only. It is suggested that similar surveys may be profitably carried out elsewhere so as to help in shaping public policy.

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## The Indian Medical Gazette fitty Wears Ago

#### LONDON LETTER

(Reproduced from the Indian Medical Gazette, Vol. 33, November 1898, p. 423)

THE destruction of the Khalifa's army and capture of Omdurman was, from a military point of view, an extremely brilliant affair. The foemen were worthy, not of steel, for, with the exception of the memorable charge of the 21st Lancers, there was little or no close fighting, but of the bullets and balls and shells, which from rifle and maxim and cannon mowed them down as they dauntlessly charged, or grouped themselves sullenly defiant on the field of a lost battle. It was a triumph of scientific warfare. It was more. It was a triumph of masterly forethought and contrivance, of careful preparation, of deliberate calculation, of efficient transport through a long line of difficult country, and of consummate military administration and management. The material supplied by welltrained British, Egyptian and Soudanese troops was excellent; but it was excellently trained and handled, and the event—the avenging of former disaster, and the re-establishment of civilization and civilized power in the Soudan-is of historical importance. The sanitary aspects of the expedition have been, so far as is known, equally satisfactory. The storms and the cholera which were encountered in the advance to Dongola. last year have been absent; but the tribute, which will no doubt be still exacted by dysentery and typhoid, has to be reckoned with, and will possibly be heavy. The medical arrangements seem to have been, as yet, fully adequate to requirements. The butcher's bill has not, fortunately, been a large one, and by means of sectional field hospitals, hospital boats and a series of base hospitals at selected points along the long line of communications—well officered and provided—the wounded have been promptly attended to and removed northwards. This is the first occasion on which the mettle of the new Royal Army Medical Corps has been put to the test, and under the skilful and masterly command of Surgeon-General Taylor, we may rest assured that it will not be found wanting in any respect. The condition of the town of Omdurman was found to be simply appalling, and after its capture it was promptly evacuated, and healthier ground of encampment sought elsewhere. The discovery of the French in occupation at Fashoda imports a new and at the moment embarrassing element into the situation; but this difficulty will no doubt be overcome, and we may reasonably anticipate the advent and inauguration of a new era of civilization, prosperity and sanitation through-

out the valley of the Nile under British control and administration. While there is every ground of congratulation in the success of the sanitary and medical services of the Soudan campaign, the medical administration of the American army is being subjected to loud and bitter animadversion, on account of shortcomings in attention to the sick and wounded of the Cuban invasion. The difficulties of the situation appear to have been formidable, and these, together with inexperience and unpreparedness, probably go far to excuse faults and failings. Still one cannot help noting with satisfaction the contrasts supplied by two military expeditions almost contemporaneous, in both of which serious geographical and climatic disadvantages were encountered, in one case with commendable success, in the other with lamentable inadequacy. Practice in peace is undoubtedly the secret of efficiency in war, and the manœuvres which have recently been undertaken by two British Army Corps on the Salisbury plains, in unexampled heat, have tested the resources of the Army Service Corps and the Royal Army Medical Corps very severely. Both have risen to the occasion admirably, and the treatment of the injured and sick of the troops has left nothing to be desired. Thus, in actual and mimic warfare, the value of the sanitary and medical services of the army is being tested and declared, and the wisdom of the recent warrant which has stamped them as an integral section of the fighting organization fully justified. The warrant which has conferred this boon upon the Army Medical Staff has not, as yet, apparently proved sufficiently attractive; for the August competition has resulted in the recruitment of only sixteen men to fill thirty-nine advertised vacancies; but it is perhaps too early to draw conclusions regarding a recent concession, which could not have materially influenced the purposes of students in the schools or young practitioners.

Dr. Robert Koch is labouring hard in Italy to solve the problem of malaria. He has entered on his task with his usual thoroughness and enthusiasm, and he is being heartily encouraged and assisted by Italian authorities and physicians. With Ross working hard on the same lines in India, valuable additions to our knowledge regarding the life-history and pathological attributes of the plasmodium malariæ ought to be forthcoming in the near future. Manson's epitome of Ross's researches was received at the Edinburgh meeting of the British Medical Association with favour. I have had an opportunity of studying Ross's report, and have formed a high estimate of the ingeniousness and patient industry with which he has applied himself to the task of discovery. It looks as if the 'function of the mosquito' were more complex and direct in abstracting, nurturing, developing and inoculating pathological organisms than at one time appeared credible.

Another great German pathologist, Dr. Rudolf Virchow, is coming over to England next month to deliver the Huxley lecture. His subject is to be the bearing of recent science on medicine and surgery, and we may expect some brilliant light to be thrown on more than one moot point in contemporary pathology. Virchow is the author and apostle of a system which brought physiology and pathology under laws of evolution and development which embraced and governed both, and it will be a matter of supreme interest to watch how he will adapt the parasitic and toxic discoveries and doctrines of the day to the tissue changes, whose nature and homologies he described with so masterly a pen. He is to be entertained at a public dinner by the leaders of the medical profession in London. Lord Lister will take the chair. The occasion will be an interesting one, and ought to elicit some of the inner memories and thoughts of a man who has lived such a busy life of devotion to science and politics.

A rigorous crusade against tuberculosis infection is being initiated in England. A recent number of the Practitioner was devoted to tuberculosis, and the subject was set forth in all its phases, the articles being written by men conversant with the various aspects of the question. An association is being organized for the prevention of consumption and other forms of tuberculosis. The promoters are Sirs Samuel Wilks and William MacCormack, Presidents of the Royal Colleges of Physicians and Surgeons; Sir William Broadbent, and Mr. Malcolm Morris. The instruction of the public, as regards the modes in which tuberculosis infection takes place, and the means by which such infection may be prevented, will constitute the principal aims of the association. The fourth meeting of the French Tuberculosis Congress took place at Paris in July last. A summary of the transactions of this body will be found in the 'Epitome of Current Medical Literature' accompanying the issue of the British Medical Journal for 13th August and the conclusions arrived at the Congress are published on page 496 of the issue for 20th August. The intentions of these conclusions, which have been widely disseminated, are similar to those of the proposed association, namely, to instruct and warn the public and point out how, by certain precautions as regards the destruction of sputum, the isolation of the sick, the disinfection of premises, the detecting of tuberculosis in cattle, their segregation and the destruction of tuberculous meat and so forth, the risks of infection may be materially reduced, and the mortality from tubercle, which now amounts to about 10 per cent of the total mortality, greatly diminished. Meantime the open-air treatment of phthisis is being extensively resorted to, and satisfactory results are reported to be gained by its adoption.

15th September, 1898.

## Current Topics, Etc.

#### Bornholm Disease in the Tropics

By W. M. JAMIESON

and

D. M. PRINSLEY

(Abstracted from the British Medical Journal, ii, 12th July, 1947, p. 47)

An outbreak of Bornholm disease occurred at Aden in the late hot season of 1946. Between 17th August and 25th October there were 35 cases. All the cases were treated in the R.A.F. hospital, with the exception of two admitted to neighbouring sick quarters, two seen at their home (family of an R.A.F. officer), and one Arab taxi-driver who attended as an out-patient.

The same basic syndrome, with minor variations, has been described under many titles—'epidemic muscular rheumatism', 'devil's grip', 'epidemic myalgia', 'Bornholm disease', 'epidemic myositis', 'epidemic pleurodynia', and 'acute benign dry pleurisy'. The condition is infective in origin and almost certainly primarily a lesion of the diaphragm, the exact nature of which is not clear.

Mode of onset.—The onset was usually abrupt, with pain, headache and some degree of tever as the most constant features. Only five cases suffered from upper respiratory tract, catarrh, for periods varying between a few days and three weeks, before the onset of classical symptoms. Two cases had prodromal colic and diarrhea, while a further two complained of lumbar backache for a few days previous to the attack. It is difficult to assess the significance of these various prodromata, since the commonest ailments seen in Aden are probably upper respiratory tract infection, nonspecific diarrhea, and short-term fevers giving rise to various combinations of aches and pains.

The pain.—The onset of pain was usually sudden and came on either at rest or after exercise. Thus one patient attributed his pain to the fact that he had spent an afternoon on the beach throwing stones. Another was seized with pain after riding, while several had been taking more violent exercise—for example, soccer and hockey. It seems most likely that these were all post hoc ergo propter hoc. As a rule the most acute pain was felt at the onset, although in a few cases an equally if not more severe attack was experienced in a recurrence. Two types of pain were observed. The first and most common was described as 'sharp', 'cutting', or 'knife-like', while the second was of a constrictive nature, one patient saying that the sensation was like having 'tight webbing strapped round the lower chest'. The pain was always worsened by respiratory effort, as in deep breathing, coughing, and yawning, and even by movement in bed. The position of greatest comfort in bed varied. Quite a number preferred lying on the affected side, while an equal number preferred to lie flat on the back. A few cases achieved comfort from being propped up in bed, and some from lying on the sound side. The pair was felt along the right or left costal margin, in the epigastrium, or in various combinations of these sites. In a few cases tightness across the anterior chest was present. Two cases had no complaint of pain, but only a febrile upset consistent with the disease, and both developed orchitis in convalescence. Referred pain was relatively common, being present in 11 cases. In several instances this was actually more severe than the pain around the lower chest. The sites affected were: shoulder-tip (bilateral), 3 cases; shoulder-tip (unilateral), 5; interscapular, 2; umbilicus to groin, 1 case. The shoulder affected was in direct relation to the side of the lower chest affected. The duration

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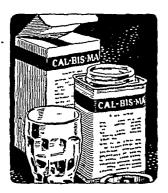


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Number of

of the pain varied from two to seven days. The longest recovery time was 23 days. It should be noted that these times are for complete clearance of the pain. Exacerbations were of frequent occurrence, but there was no real instance of relapse. In several cases the initial pain had almost, but never entirely, disappeared before recurring in an equally and sometimes more severe form.

Headache.—Headache was present in 18 of the 35 cases. In 11 it occurred at the onset, while in the remaining seven it came on in from two to seven days. The post-onset headache were always more severe than the others, and almost amounted to a definite complication. The pain was excruciating, being frontal in three instances and generalized in four. In one case the headache was associated with signs of meningeal irritation and was severe enough to warrant lumbar puncture. The cerebro-spinal fluid, although showing a very slight increase in pressure, was normal in every other respect. The duration of the headache in its severe phase varied from one to four days, but occasionally the patient was left with a 'heaviness' or dull ache for several days longer.

Pyrexia.—With one exception every case was pyrexial at the onset. Twenty-two had temperatures not exceeding 100°F. (37.8°C.), seven between 100° and 102°F. (37.8° and 38.9°C.) and five over 102°F. The highest temperature noted was 105°F. (40.6°C.), but the higher temperatures were never sustained beyond a single recording. The chart usually showed a fairly rapid return to normal, 28 cases being normal within four days, 32 within seven days, and 34 within 12 days. The pulse rate for the most part was in accordance with the temperature.

Sore throat.—Fourteen patients complained of soreness of the throat in the initial phase. All of these presented a generalized inflammation of the fauces without exudate. Throat swabs were examined in six of these, with the following cultural results: Staph. albus, 1 case; Staph. aureus, 1; non-hæmolytic streptococcus, 1; hæmolytic streptococcus and Str. viridans, 1; Staph. albus, non-hæmolytic streptococcus, and Str. viridans, 1; no growth 1. Throat swabs were also examined in six cases without sore throat, the result being: Staph. albus and non-hæmolytic streptococcus, 3 cases; non-hæmolytic streptococcus, 2; Staph. albus, 1 case.

Other symptoms.—Anorexia was fairly common (21 cases). Nausea was present in two cases, vomiting in one. In two cases cough with sputum was troublesome in the acute phase. Pain in the lower limbs was observed in one case. The bowels showed no great change from the normal, diarrhea being present in six cases, constipation in five.

Physical signs.—Examination of the chest revealed no abnormal signs, except in one case in which a very distinct pleural rub developed on the sixth day of the disease and lasted for eight days. The rub was unusual both in its intensity and in its wide distribution over the chest and it could be demonstrated by palpation as well as by auscultation. It seems probable that it was due to a superadded fibrinous pleurisy. Repeated clinical and radiological examination showed no signs of any effusion. Subcostal tenderness was present in 16 patients—unilateral in 10, bilateral in three and epicastric in three. Upper abdominal guarding and rigidity were noted in only four cases. Cutaneous hyperæsthesia was not a feature of this outbreak, but was observed in four cases. It was localized to the costal margin and corresponding lower part of the chest.

Radiological findings.—X-ray films of the chest were taken in 25 of the cases, while 21 were screened in the acute phase of the illness. The diaphragm was freely mobile in every case and no abnormality was found in the lung fields.

Hamatology.—Twenty-four cases were subjected to blood examination, comprising red cell count and hamoglobin estimation, white cell and differential count,

and erythrocyte sedimentation rate. The red cells varied between 42 and 5 millions per c.mm. and the hæmoglobin between 80 per cent and 100 per cent (Sahli). The colour index was invariably around 1. There was no abnormality in the red cells, and no abnormal cells were present. These findings are in accordance with those obtained in healthy persons in Aden. The white cell counts were: Under 8,000 per c.mm., 2 cases; 8,000-10,000, 10; 10,000-12,000, 10; 12,000-13,000, 2. Differential counts showed that any increase in cells was in the polymorphonuclears. Lymphocytes, monocytes and cosinophils showed no departure from normal. The crythrocyte sedimentation rates (Westergren method) in the acute stage of illness were:

							cases
0-15	mm.	in	1st	hour			5
15-20	17	,,	,,	,,		• •	4
20-30	**	**	,,	**	• •	• •	6
30-40	31	"	**	••	• •	• •	2 4
40-50	,,	"	,,	,,,	• •	••	2
50-60	59	"	"	"	• •	••	2
60~70							

The crythrocyte sedimentation rate, noted at weekly intervals, showed a return to normal in periods varying between 7 and 21 days, thus revealing a very distinct lag behind clinical clearance. In the cases developing orchitis in convalescence a distinct rise in the ESR, was noted in six instances, while in a further six the progress of the ESR, to the normal figure was uninterrupted. (Note: 0-15 mm, in the first hour was regarded as a normal figure for men in Aden.) Blood culture was carried out in only one case. The culture remained sterile.

Complications.—Orchitis was by far the most outstanding complication, occurring in 12 of the 30 male cases. It was always unilateral, and affected the right and left sides equally. There was usually an accompanying mild febrile reaction. The orchitis cleared for the most part in two to six days, only one case lasting as long as 10 days. There was no apparent corresponding ovaritis in any of the female patients. Headache developing after the onset was, as already stated, of such intensity as to be classed as a complication, and was present in seven cases. Actual encephalitis or meningo-encephalitis, which has been reported in other outbreaks, was not observed by us. Pleurisy has also been described as a complication. One case developed a marked pleural rub, which we considered to be due to a fibrinous pleurisy. Physical signs disappeared in eight days and x-ray findings were normal.

#### TREATMENT

Treatment was perforce symptomatic. The milder analgesics such as codeine and aspirin were largely used and found of some value. Likewise the salicylate group of drugs often gave relief, and these combined with a nightly barbiturate became the routine line of treatment, with the hypodermic injection of morphine ‡ gr. (16 mg.), reserved for especially severe cases. The patient was made comfortable in bed in the position he himself chose, and he had what he wished to eat. The appetite usually recovered quite quickly. The headache was often of such severity as to justify the prescribing of morphine. Orchitis was treated simply by rest in bed and the use of suspensory bandage.

#### DIFFERENTIAL DIAGNOSIS

In its epidemic form Bornholm disease is unlikely to be confused with other conditions, but sporadic cases occurring at the start of an epidemic may give rise to considerable difficulty.

(a) Pleurisy has obviously to be considered, but the unilateral nature of this condition, together with the absence of chest signs in Bornholm disease, is usually sufficient differentiation. Scadding, however, detected a pleural rub in 11 of his 20 cases, and indeed used the name 'acute benign dry pleurisy' for the disease.

(b) Upper abdominal emergency has been reported as being simulated by Bornholm disease. Although a few of our cases presented upper abdominal tenderness and muscular guarding there was never any great difficulty in deciding that the case was not an acute abdomen.

(c) Infective hepatitis in the pre-icteric stage can give rise to real difficulty. Here we have an illness characterized by pain, tenderness, and sometimes muscular guarding below the right costal margin, by pyrexia, and by general upset. The pain, however, has never the same relation to respiratory effort, and nausea and vomiting are much more constant. The development of jaundice and the presence of bile in the urine about the fourth to seventh day finally clinch the diagnosis.

(d) Malaria was an occasional difficulty, especially

(d) Malaria was an occasional difficulty, especially those cases showing pyrexial symptoms with pain in the left side and tenderness on palpation below the left costal margin without obvious splenic enlargement. The practice of examining blood film for malaria parasites in all cases of pyrexial illness usually, but not always, provided the answer.

#### EPIDEMIOLOGY

The outbreak reported here occurred in the late, hot season in Aden. A study of meteorological charts revealed no significant climatic changes from previous years.

The causal agent has never been discovered. The clinical picture, the nature of the complications, and the failure to demonstrate any constant bacterial agent suggest a virus infection, although the mild leucocytosis encountered invariably showed an increase in the polymorphonuclears. The mode of spread, too, is somewhat vague. The various modes postulated have been direct by droplet infection and indirect by infected water, infected food, or insects. In Aden, there are several well-defined communities. These include the British Services, Indian Services, European civilians, Indian civilians, and the local native population (chiefly Arabs and Somalis). As previously stated, the outbreak was confined to the British Services, with the exception of the single case in an Arab. The water supply is derived from deep wells and is very pure. It is examined bacteriologically at regular intervals at many points and has always been satisfactory. Moreover, the supply is common to the entire population, and it is difficult to conceive why, if the infection were waterborne, virtually the Services alone should be affected. The native population use goats' milk chiefly. The Europeans use cows' milk, drawing their supplies from two main sources—a civilian dairy-farm and a Services dairy-farm—but there is considerable interchange between the two. No cases of the disease occurred in the staffs of the respective dairies, and bacteriological examination of the milks was satisfactory at the time of the outbreak. Ecod-horne infection at the time of the outbreak. Food-borne infection was considered, since food supplies to the British Services, civilians, Indian Services, and natives were all from different sources. An interesting feature in this respect was seen in one camp where a unit of Cingalese troops were living in proximity to an Indian unit. The Cingalese were on British Service rations, while the Indians had their own special dietary. Two of the Indians had their own special dietary. Two of the Cingalese detachment developed the disease, while no cases occurred among the Indians. It must be stated, however, that in spite of the close proximity of these units there was practically no 'mixing' between the two. Another most interesting fact was that while the medical staff of the Indian hospital in Aden saw no cases of Bornholm disease, they did have an outbreak of mumns among Indian personnel at that time. The R.A.F. and civilian authorities did not have a single case of mumps. The importance of this will be realized when one states that the Indian authorities had several cases admitted with the indian authorities and several cases. admitted with orchitis which they presumed in view of their epidemic, to be complications of 'missed' cases of mumps. Insect-borne disease is unlikely, since Aden is comparatively free from most of the usual pathogencarrying insects.

While infection conveyed by milk or food cannot be excluded, it seems more likely that the spread is direct by droplet infection. The disease is known to occur in Egypt, and Aden is reached in less than 24 hours from there by the usual air route, thus making the introduction of infection, even with the shortest incubation period, easy. There is surprisingly little 'mixing' between Service and civilian personnel in Aden, so that an epidemic in one would not necessarily pass readily to the other. The case of the Arab taxi-driver may be significant, for here was a native, having his own particular diet including goats' milk, who developed the disease in a fairly severe form. Droplet infection would seem the most obvious mode of spread in this instance. There was one example of family infection—an R.A.F. officer, his wife, and two children all developing the disease at varying times within eleven days. At the height of the outbreak five of the hospital staff, including one medical officer, one nursing sister, and three nursing orderlies, all in close contact with cases, developed the disease. Furthermore, one patient, who was in hospital with a left-sided pleural effusion for about three months, contracted Bornholm disease affecting chiefly the right side and complicated by the affecting chiefly the right side and complicated by the later development of orchitis. He had been nursed in a general ward which included several cases of the disease, and was almost certainly cross-infected. Lastly, the incidence of faucial inflammation at the onset in 14 cases would seem to lend support to the view that the mode of spread is direct from case to case by droplet infection. The incubation period appears to be a short one. Huss found it to be about four days, and such evidence as we had agreed with this finding.

#### SUMMARY

An outbreak comprising 35 cases of Bornholm disease occurring in Aden in the late hot season is described.

The clinical picture, with minor variations, approximated to the classical syndrome.

Blood examination showed only a slight polymorphonuclear leucocytosis and a raised E.S.R.

Radiological examination showed no deviation from

Orchitis was the most outstanding complication, being present in 12 of the 30 male cases. Dry pleurisy complicated one case, while headache of such severity as to be classed as a complication was present in seven.

The epidemiology is discussed. Direct droplet infection is considered the most likely mode of spread, although food or milk-borne infection cannot be excluded.

#### Enteric Fever

A Preliminary Report on the Investigation and Treatment

By J. C. PATEL L. MONTEIRO D. D. BANKER and

Miss B. P. KAPADIA (Indian Physician, December 1947, p. 39)

ONE HUNDRED cases have been investigated out of which 51 were enteric cases, 37 of these being culture-positive.

The percentage of positive cultures has been much higher than recorded by other observers.

Rose spots were found to be present in 12 of the 37 cases.

In 9 cases bacteriophage treatment was tried; in only 2 cases there was the expected immediate improvement.

Penicillin with sulphathiazole treatment was instituted in 9 culture-positive cases and penicillin alone in 2 culture-positive cases. In 2 of the former, the temperature touched and remained normal at the end of treatment. In 2 other cases the combined treatment brought the morning temperature down to normal, but it was 6-8 days before evening temperature became normal. In one case penicillin alone had a similar effect.

In one case the first combined treatment had no effect and blood culture remained positive at the end of it. However, the second course of 5 days succeeded in bringing down the temperature to normal. One patient who was severely toxic, rowdy and semiconscious was administered the combined course. There was marked improvement in general condition, rowdyism and toxicity, but the temperature ran its course for 5 weeks before touching normal.

One female patient was given penicillin alone. There was marked improvement in the general condition and the temperature remained normal for a day. During the course of treatment she had abortion, diarrhæa and intestinal hemorrhage. Later she developed intestinal perforation and succumbed to it despite best of surgical aid. The husband of this woman who was warded simultaneously and kept as a control also died indicating the virulence of the infecting strain from the same source.

Two other cases who were given the combined treatment died of hyperpyrexia, one on the second day and the other on the fourth day of treatment. They were evidently severe cases and succumbed before the treatment was effective.

Another case died of pneumonia and pulmonary cedema during the course of treatment.

By giving the diet early in the course of the disease and administration of adequate fluids from the beginning, there was a rapid progress in the convalescence and general condition of the patient.

There have been no relapses in the series.

In the two cases of intestinal hæmorrhage diet was continued throughout with beneficial results.

The following two items are reproduced from Surgical Newsletter No. Wa-6, dated August 1948, prepared by the American Medical Association.

## Correction of Hypoproteinæmia by the Administration of Plasma and Blood

ALLEN and his associates report the results of a study in which nine hypoproteinæmic patients were given large volumes of plasma in an endeavour to elevate the plasma proteins. Whole blood was sometimes given to correct anæmia, but in all but two patients the greatest source of parenteral protein was plasma. These last two patients were carried on plasma and blood to correct the pre-operative hypoproteinæmia; later, when the hypoproteinæmic state reappeared in the post-operative period, amigen was given instead of plasma, and the relative efficiencies of these two sources of nitrogen as corrective agents were compared.

Summarizing their observations the authors say that the amounts of plasma, usually given daily, were large as measured by current practice, but the amount of nitrogen given by this method was less than that advocated when protein hydrolysates are used for this purpose.

The increase in the plasma protein concentration was rapid after these quantities of plasma and blood were given and normal values were usually established within five to seven days.

Nitrogen balance studies and plasma volume changes were made on six of these patients and showed that most of the transfused plasma probably left the blood stream within a day or two. That which could not be accounted for on the basis of an increase of total

circulating plasma protein may possibly have been recast as tissue protein, since there was little, if any, evidence of a latent increased nitrogen exerction. The possibility that small increases of nitrogen exerction over a prolonged period of time may have occurred has not been detected in this study.

Larger amounts of plasma and blood were required to elevate the plasma protein concentration in the more severely starved patient than in the better nourished one, even though the plasma protein concentrations were reduced to similar levels in both groups.

Blood transfusions alone were administered daily with one exception for 11 days to one patient, and as in the case of patients receiving plasma, the plasma protein concentration was restored to normal without evidence of latent nitrogen loss.

This work suggests that the fear of overtransfusion is unwarranted except where the cardiovascular reserve is reduced. It also emphasizes the importance of great enlargement of facilities for obtaining blood and plasma and the wisdom of using blood in some patients in place of plasma because of the gain in oxygen-carrying cells and the possible utilization of hæmoglobin to form tiesue proteins.

(Allen, J. G., Chicago, Ill., Bogardus, G., Egner, Willadene, and Phemister, D. B.: Surgery, Gynecology and Obstetrics, 56, 601-616, May 1918. The authors are connected with the Department of Surgery of the University of Chicago.)

## Studies in Vagotomy in the Treatment of Peptic Ulcer

Meyer and his associates say that a study of vagotomy in the treatment of peptic ulcer was begun at the Cook County Hospital in Chicago in June of 1946. Patients having a severe ulcer diathesis were selected for this study. In all 35 cases previous medical or surgical management had failed to give relief from pain. The duration of symptoms ranged from 1 to 36 years with an average of 11 years. There were 16 instances of previous perforation; 19 patients had had previous bleeding, 10 of whom had had massive hemorrhage; and six patients had pyloric obstruction which, in three patients, was complete. Repeated attacks of severe epigastric pain were present in 31 of the 35 patients and in 12 the pain was intractable. Duodenal ulcer was present in 26 patients, marginal ulcer in seven patients; one patient had a gastro-jejunal colic fistufa and one had a prepyloric ulcer.

The transthoracic approach was employed in the first nine cases and the transabdominal approach in the remaining 26 is now preferred because it has several advantages. The patients have been followed up for from 6 to 15 months since the operation. All had immediate relief from ulcer pains. Thirty-one of the 35 are leading an unrestricted life for the first time in many years. Dietary and medical treatment has been completely eliminated. The majority of patients noted a change in the bowel habit. They had one or two soft bowel movements a day, whereas preoperatively almost every patient gave a history of constipation. Troublesome diarrhea occurred in two patients. However, the diarrhea disappeared spontaneously after two months. Thirty patients had satisfactory weight gain. Thirty-one patients expressed themselves as being well satisfied with the results. The most striking results, from the standpoint of relief of intractable ulcer pain, have occurred in eight patients with marginal ulcer.

One patient died on the eighth post-operative day due to uremia and lower nephron nephrosis which followed a blood transfusion reaction. Recurrence of ulcer symptoms with positive x-ray evidence of peptic ulcer occurred in four cases. One patient developed an acute gastric retention and dilatation on the tenth

post-operative day which was treated effectively by gastric lavage followed by the administration of doryl (carbamylcholine).

The symptoms of cardiospasm, verified roentgenologically in two instances, were noted in three patients about two weeks post-operatively. The dysphagia, substernal discomfort, and regurgitation of food were spontaneously relieved in from one to three weeks.

One patient had a loss of appetite with a failure to gain weight, and one patient had occasional vomiting. One patient, who had an excellent clinical result, was re-admitted to the hospital three months following vagotomy with a broncho-pneumonia from which he died. Necropsy showed the pneumonia to be unrelated to the previous vagotomy.

The most frequent and disturbing complication was gastric retention and distension; but this has been controlled by the use of a gastro-enterostomy if pyloric obstruction was present, by careful post-operative management, and by occasional use of doryl or urecholine.

Thirty patients were tested for completeness of vagotomy by the insulin test. A total of eight patients had doubtful or incomplete vagotomy and four of these

have had recurrence of ulcer symptoms.

The permanency of the altered gastric function following complete vagotomy is not yet certain and little is known of the effect of vagotomy on the other organs innervated by the vagi. Until more information is available concerning the incidence of recurrence of ulcer distress and the possible late sequelæ, the use of vagotomy should be limited to clinical investigation with one exception; complete vagotomy is the method of choice in the treatment of marginal ulcer following gastric resection.

(Meyer, K. A., Chicago, Ill., Rosi, P. A., and Stein, I. F.: Surgery, Gynecology and Obstetrics, 86, 524-529, May 1948. The authors are connected with Cook County Hospital in Chicago.)

#### British Anti-Lewisite: A New Therapeutic Agent

(Abstracted from the Pharmaceutical Journal, Vol. 159, 18th October, 1947, p. 281)

B.A.L. is the convenient short label for 2: 3-dimercaptopropanol. The letters are an abbreviation for British anti-lewisite; the name reveals the purpose for which the substance was investigated, namely, as a remedy for the arsenical vesicant lewisite, one of the lethal gases developed as a chemical weapon during the 1914-18 war.

Effects on the skin.-Inunction of approximately 0.3 gm. B.A.L. in the form of a 10 per cent incorporation of B.A.L. in a therapeutically inert jelly produced no signs or symptoms except transitory local erythema, whealing and itching at the site of application.

Systemic effects after inunction.—It has been noted that when B.A.L. was applied to a certain damaged skin area, improvement in damaged areas at a distance from the treated lesion also occurred. There were no deleterious systemic effects.

Intramuscular administration.—A solution containing 10 per cent B.A.L. and 20 per cent benzyl benzoate in peanut oil was given in varying dosage by deep intramuscular injection to 34 volunteers. There was considerable individual variation in response to B.A.L. In general, toxic manifestations appeared at a dosage of approximately 3.6 to 5.5 mgm. per kg. body weight. These manifestations included nausea, vomiting, headache, burning sensation of the lips, mouth and throat, feeling of constriction and competitions in throat, feeling of constriction and sometimes pain in throat and chest, burning and tingling of extremities, conjunctivitis. lachrymation, rhinorrhœa, salivation, sweating of forehead and hands, abdominal pain and general agitation. Local pain at the site of injection

and muscle spasm of the legs were also quite common. The most significant feature was elevation of the systolic and diastolic blood pressures within about 2-hour after the injection.

Except in one subject in whom symptoms of intoxication persisted for over 24 hours, the subjects had returned to normal within 45 minutes to 2 hours after the injection. No regular cumulative effects were noted when doses of approximately 5 mgm. per kg. were given in four successive injections four hours apart. However, when the first two injections were given with an interval of only two hours, distinct cumulative toxicity was observed. Injection of B.A.L. has been shown to cause in man an increase in the excretion of arsenic by the kidney, both in normal subjects and in those exposed to arsenical smokes.

#### THERAPEUTIC APPLICATIONS

Arsenical dermatitis.-This occurs most commonly as a complication of arsenotherapy and less commonly as an industrial accident to which are liable workers with arsenical dusts. Longcope and his collaborators have published an account of the treatment with B.A.L. of 22 cases of this condition. The remedy was administered by inunction and injection and the results of treatment were uniformly satisfactory especially with regard to the shortened duration of the dermatitie as compared with that of a control series. Sulzberger and Baer have reviewed 88 cases of arsenical dermatitis reported by Eagle, of which 80 per cent responded favourably to treatment whereas 20 per cent did not. In this series the average time for effecting definite improvement in exfoliating conditions was three days, and the average time for almost complete recovery was thirteen days.

Other complications of arsenotherapy.—In the same paper Sulzberger and Baer summarize Eagle's experience of the effects of B.A.L. in other complications of arsenical therapy as follows:-

Toxic encephalitis.—Of 55 patients, of whom 40 were either convulsing or in coma at the start of B.A.L. therapy, 44 recovered completely within 1-7 days and 11 died. In some cases resulting in death, delay of treatment or too small a dosage of B.A.L. appeared to be partly to blame for the result.

Granulocytosis.—There cases treated; were 11 10 recovered. There was one death.

Aplastic anæmia.-In three cases there was no beneficial effect from B.A.L.

Jaundice.—Of 14 patients, 5 showed prompt response to B.A.L., 7 evinced no effect, and there were 2 in which the effect were debatable.

Massive overdosing of oxyphenarsine hydrochloride-Of 4 cases, 3 showed a prompt response to B.A.L. therapy; 1 died (this patient received too small a dose of B.A.L.).

Arsenical fever.—There were 44 cases with prompt recovery in all.

B.A.L. has also proved useful in acute mercurial and gold poisoning.

#### THERAPEUTICS OF ACUTE METALLIC POISONING

When B.A.L. was first used in the treatment of acute arsenical poisoning it was used in an ointment containing 5 per cent w/v. B.A.L. in a bland base. About 1 gm. of this ointment was well rubbed in on successive skin areas.

The discovery that B.A.L. dissolved in benzyl benzoate was miscible in peanut oil (ol. arachis) in all proportions and that such a mixture could be packed in ampoules and sterilized by autoclaving at 120°C. for 20 minutes without significant deterioration made the intramuscular route of administration the method of choice. American investigators have hitherto favoured a 10 per cent w/v. solution of BAL. in a 20 per cent benzyl benzoate solution in peanut oil, whereas British workers have used a 5 per cent w/v. solution of B.A.L. in the same vehicle.

## Vitamin Therapy-its uses and limitations

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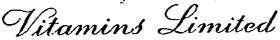
Adequate safeguards against the hazards of pregnancy are now routine in practice. Among these, the provision of essential foods to pregnant women has had a significant effect in reducing maternal and infant mortality. Cases still occur, however, in which full advantage is not taken of the nutrients present in foods. Where patients are found to be anæmic, debilitated or showing signs of subnormality in respect of the protective factors, the simplest prescription for ensuring an adequate intake of a wide range of nutrients is that of

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Fig. 1 (Above).

Fig. 2 (Below).



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DOSAGE OF B.A.L.

The dosage of B.A.L. hitherto employed has varied according to the severity and type of poisoning treated.

Arsenical poisoning.—Eagle, who has, perhaps, hitherto the greatest experience in the treatment of complications of arsenical therapy, has suggested the following

scheme of dosage :-

Severe cases. 3 mgm. per kilo of the patient's body weight is given by intramuscular injection deep in the gluteal region. For the first two days six injections are given at 4-hourly intervals (to avoid the cumulative toxic effects of B.A.L.); four injections are given on the third day and two injections thereafter for ten days or until complete recovery.

Mild cases.—2.5 mgm. B.A.L. per kilo is given in each injection. For the first two days four injections are given at 4-hourly intervals; two injections are given on the third day and one or two injections daily thereafter for ten days or until complete recovery.

Mercury poisoning.—Longcope and his collaborators recommended for the treatment of acute systemic mercurial poisoning an initial intramuscular injection of 300 mgm. of B.A.L. followed within the first twelve hours by two, or even three, further injections of 150 mgm. each. The system of dosage may give rise to certain toxic reactions attributable to B.A.L., but these may be discounted under the circumstances. these may be discounted under the circumstances

Gold poisoning.—The dosage of B.A.L. used for cases of gold poisoning is still somewhat indefinite, but

Lockie and his collaborators obtained good results with a dosage calculated on the basis of 2.5 mgm. of the drug per kilo body weight.

It is emphasized that the use of B.A.L. does not obviate the need for general treatment. Cases of arsenical dermatitis require restoration of the protein loss they have sustained as well as local treatment of the skin. Sedatives may be needed to control irrita-tion. The cases of acute mercurial poisoning recorded by Longcope were treated on admission to hospital by gastric lavage with a 5 to 10 per cent solution of formaldehyde sulphoxylate in addition to the intra-muscular injection of B.A.L. Patients who were admitted in a condition of shock were given transfusions of blood as well as the usual infusions of physiological salt solution and 5 per cent glucose.

The only serious contra-indication to B.A.L. therapy is where there are signs of liver damage. Kidney damage does not appear to be a contra-indication in

the intoxications under reference.

All writers emphasize the necessity for early treatment if B.A.L. therapy is to be effective. For acute mercurial poisoning, the prognosis is good if treatment can be instituted within four hours of the onset. As treatment by B.A.L. is delayed so does the prognosis become graver.

#### CONCLUSION

Carleton and others have pointed out with reference to acute arsenical dermatitis that toxic manifestations are not necessarily due to the presence of arsenic but may result from sensitization to a foreign protein brought into being by the arsenic. They also state that tissue stores of arsenical compounds must exist in quantities such that, even when arsenic has been removed from the skin, the weakened cells may be repoisoned, occasioning relapses. Such considerations suggest that some cases of so-called arsenical dermatitis cannot respond to an antidote and that in this there may be an explanation of the failure of B.A.L. to effect improvement.

#### Cardiolipin-Lecithin Antigen

By B. S. KLINE

(Abstracted from the Archives of Dermatology and Syphilology, Vol. 55, April 1947, p. 514)

Essentially chemically pure cardiolipin-lecithin antigen, isolated by Pangborn and reported in 1941, has

been found to give more specific results in the microscopic slide precipitation test in non-syphilitic patients than Eagle, Hinton, Kahn, Kline and Mazzini antigens and more sensitive results in patients with syphilis than Hinton, Kahn and Kline antigens.

The simplification of technique from complex, timeconsuming complement fixation tests for syphilis, requiring four reagents, to comparatively simple rapid flocculation tests, requiring but one, has been of great benefit to all concerned with the serodiagnosis of the

The most recently developed flocculation tests for syphilis are based on a mixture of the ingredients on an open slide. The slide tests are easier to perform and to read accurately and are more economical of time, material and space than are the tube tests.

More important in the development of a single standard test of the blood for syphilis than the simplification of technique is the improvement in the quality

of the antigen employed.

A mixture of 1 part of cardiolipin and 9.4 and 10.6 parts of lecithin gave results of maximum specificity and of much greater sensitivity than did Kline antigen.

That cardiolipin-lecithin antigen is not absolutely specific for syphilitic reagin is evidenced by the occurrence of occasional positive reactions in non-syphilitic patients and in patients with leprosy, as reported by Rein. It has been pointed out also that results with optimal cardiolipin-lecithin antigen are not always reliable in tests with uterine blood and blood from the cord and with merthiolated serum. Furthermore, positive reactions occur in tests of cardiolipin-lecithin antigen with horse, sheep and hog blood serum.

In spite of these limitations of cardiolipin-lecithin antigen, the fact that it is composed of essentially chemically pure lipids makes it possible for the first time in the serodiagnosis of syphilis to obtain uniform results with lot after lot of antigen.

#### Treatment of the Syphilitic Pregnant Women with Penicillin in Oil-Beeswax: A Comparison with Results obtained using Aqueous Sodium Penicillin

By N. R. INGRAHAM et al.

(Abstracted from the Journal of Venereal Disease Information, Vol. 28, August 1947, p. 155)

EXTENDED study of aqueous sodium penicillin in the treatment of the syphilitic pregnant woman in total dosages of 1.2 and 2.4 million Oxford units given at 3- to 4-hour intervals over periods of 8 to 10 days continues to show better results than any previously employed method of treatment. Forty-four cases of symptomatic early, 36 cases of early latent, and 12 cases of late syphilis are included in this group.

The clinical response of the pregnant woman treated with aqueous sodium penicillin is at least equal to that found generally in the treatment of symptomatic early syphilis with 1.2 or 2.4 million units. The incidence of clinical relapse has been 5.4 per cent. Two patients were reinfected after a period of more than 2 years.

The fact that 32 per cent of the women treated with aqueous penicillin for symptomatic early syphilis were aqueous penicillin for symptomatic early syphilis were still scropositive at the end of the period of observation and that the average interval to sustained scronegativity was 245 days may indicate that dosage has been too low. It is suggested that the penicillin dosage for the pregnant woman be at least that generally employed for the patient with early syphilis. These studies have indicated no advantage in using a total dose of 2.4 million units rather than 1.2 million units in protecting the fœtus, provided the duration of therapy is at least 7½ days and the interval between injections is 2 to 3 hours. Cure of the mother, however, may require higher dosage than this, so that a minimum total dose of 2.4 million units of aqueous sodium penicillin is recommended. There is no obvious contra-indication to larger dosage than this. Maximal rather than minimal therapy is desirable for both rather than minimal therapy is desirable for both mother and infant, should any question arise as to what treatment course to employ.

Forty-five mothers have been treated with a total dosage of 4.8 million Oxford units of amorphous calcium penicillin in peanut oil-beeswax, given over a period of 9 days. The overall results are approximately equivalent to those of aqueous penicillin. Two living syphilitic infants have resulted, or a failure rate of 4.9 per cent.

There is some indication that penicillin in oil-becswax is less effective for symptomatic early syphilis in late pregnancy, if the fœtus is already infected. In this situation, better results can be obtained more uniformly

by using aqueous penicillin in hospitalized patients.

Possibly one of the reasons for the greater incidence of stillbirths in the penicillin in oil-beeswax group is the inability of this procedure to sustain blood and tissue levels of the penicillin high enough to produce a uniformly satisfactory concentration in the fætal tissues.

When the titre of syphilis reagin did not drop at 1 month following birth and when the infant did not respond well to optimal pediatric care, the infection of the infant was considered to be active and treatment was instituted.

The risk of infection of the fœtus seems to increase in proportion to the early symptomatic activity of the disease in the mother. An analysis by the stage of syphilis at the commencement of therapy, irrespective of the type of penicillin course employed, shows that 3 living syphilitic infants (5 per cent) occurred among 60 mothers with symptomatic early syphilis; 1 living symbolities infant (16 per cent) resulted among syphilitic infant (1.6 per cent) resulted among 60 mothers with early latent syphilis, and no syphilitic infants were born of 18 mothers with late syphilis.

Women still seropositive at the end of 1 year after penicillin therapy for syphilis during their pregnancy still have a fair chance to become seronegative during the second year, or perhaps during the third year, without additional treatment; and a negative blood serologic test in the mother is not essential to obtain a non-syphilitic infant, inasmuch as the infants in this study have been 97.8 per cent normal, irrespective of the serologic response.

# Reviews

Oglivie, M.D., F.R.C.P. (Edin.), F.R.S.E. Robertson PATHOLOGICAL 1947. E. and S. Livingstone Limited, Edition. Edinburgh. Pp. xil plus 459. With 260 photo-miorographs in colour. Price, 37s. 6d. Postage, 9d. (home)

This book is much more than its name suggests. It is a complete book on pathology based on histology and gives an account of tissue changes in diseases common in Great Britain. Further, it follows the usual plan of dealing with degeneration, vascular disturbances, inflammation, repair, new growths and diseases of systems, serially. Ætiology and clinical correlation are also given.

The chapters on Tumours, and Hæmopoietic System are particularly informative, the former for describing and detecting diagnostic features and the latter for forcing an otherwise top-heavy subject into its proper place in a reasonable number of pages.

In the preface the author makes grateful acknowledgment, amongst others, to Colonel W. F. Harvey, one

of the elders of the late I.M.S. and of the Indian Medical Research Departments, who retired from the Central Research Institute, Kasauli, over 20 years ago. This fact should make the book specially valuable in India because of the Indian experiences of Colonel Harvey.

The printing and photomicrographs in colour are excellent. The price is reasonable.

S. D. S. G.

PATHOLOGY IN SURGERY.—By N. Chandler Foot, M.D. 1945. J. B. Lippincott Company, Philadelphia and London. Pp. x1 plus 511 with and delphia and London. Illustrations in black and white and 20 subjects in full colour on 10 plates. Price, £3

A very acceptable addition to the existing books in surgical pathology. The opening chapters are devoted to the methods of technique which are practical, lucid and well selected—a very valuable help to the 'Clinical Pathologist'.

The body of the book has condensed very usefully and readably all the information about pathology of surgical interest. The sections on bones and the breast in the female are particularly well written.

The volume should be found useful by all surgeons.

THE SURGERY OF THE STOMACH AND DUO-DENUM.—By T. H. Somervell, M.A., M.B., B.Ch. (Cantab.), F.R.C.S. (Eng.). 1948. Edward (Cantab.), F.R.C.S. (Eng.). 1948. Edward Arnold and Company, London. Pp. viii plus 548. Illustrated. Price, 48s.

An exhaustive treatise on stomach and duodenum surgery by a surgeon with vast experience in India should be welcomed by all surgeons interested in the subject. Such vast experience is unique and seldom falls to the lot of even the top-ranking surgeons. Consequently the book will be read with absorbing interest. It covers all the ground of pathological lesions of the gastro-duodenal area. He is bluntly definite in his declaration that gastro-jejunostomy alone is useless in the treatment of peptic ulcer and most surgeons will agree with him. His advocacy of vagotomy and devascularization is supported by the results he has obtained. Yet at the same time he has also given the impression that gastrectomy partial or even complete is the operation of choice. His discussion on the incidence of carcinoma in relation to peptic ulcer in relation to peptic ulcer is valuable, though many pathologists may differ from him.

He has described fully the methods of the surgical measures and that would be of great help to younger

surgeons.

L. M. B.

TEXTBOOK OF GENITO-URINARY SURGERY.—
Edited by H. P. Winsbury-White, M.B., Ch.B.,
F.R.C.S. (Edin.), F.R.C.S. (Eng.). E. and 5.
Livingstone Limited, Edinburgh. Pp. xv plus 1048
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Some portions must have been written in haste and no doubt corrections where needed will be made in later editions. For example in the last two lines on page 2 the description of the posterior edge of external oblique, may be made clearer in the direction its fibres take. The book will find a place in all





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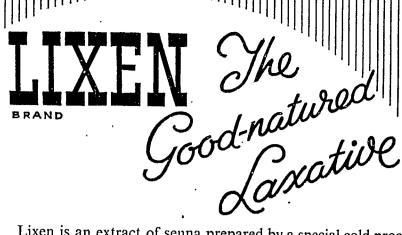
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libratics of teaching hospitals and will be sought for by aspiring young genito-urinary surgeons.

I., M. B.

TREATMENT BY MANIPULATION.—By A. G. Timbrell Fisher, M.C., M.B., Ch.B., F.R.C.S. (Eng.). Fifth Edition. 1948. H. K. Lewis and Company, Limited, London. Pp. ix plus 275 with 128 illustrations. Price, 25s.

A READABLE exposition of manipulation methods in the treatment of disabilities following injuries and some A discussion with arguments in favour of manipulative procedure in the conflict between rest and movement is well expressed and illustrative cases help towards the manipulation methods. The manipulations are fully and lucidly described in almost every case needing such procedure and those interested in the prevention and treatment of disabilities following injury and disease will find the book useful. L. M. B.

THE TREATMENT OF MALIGNANT DISEASE BY RADIUM AND X-RAYS BEING A PRACTICE OF RADIOTHERAPY.—By Raiston Paterson, M.C., M.D., F.R.C.S.E., D.M.R.E., F.F.R. 1948. Edward Arnold and Company, London. Pp. 612 exclusive of Index and Dosage Graphs. Profusely Illus-Price, 45s. trated.

In his introduction the author states this book is essentially a statement of the principles and practice of the Radium Institute in Manchester (now part of the Christic Cancer Hospital and Holt Radium Institute) and there is no intention of implying that the methods and ideas presented are necessarily the best, the correct or the only methods.

In keeping with this concept the first three chapters of the book are concerned with the particular principles

of the book are concerned with the particular principles on which the Manchester system is based.

He further states that it is impossible to make any justifiable distinction between x-ray therapy and radium therapy. The two are essentially the same in principle and effect, differing only in those factors which result from the different origin of the two radiations and which therefore govern their applicability. Finally put succinctly, the book starts with, as its medium capma rays after they have left the needles.

medium gamma rays after they have left the needles or tubes, and x-rays as a beam of radiation on the patient's side of the filter.

And now for the book.

From what has been said above it will be gathered that the book gives an overall account of the treatment of malignant disease by radium and x-rays from the Manchester viewpoint.

After dealing with general principles, there interesting section devoted to beam directed field x-ray therapy, with a description of various gadgets including the back pointer and entrance directors. This is a comparatively new development which is further developed in subsequent chapters.

The radium dosage system is described in another chapter. The Manchester system was first introduced to the medical profession in papers by Paterson, Parker and others in 1934 and 1938, and has proved of immense value to workers in the radium treatment of malignant disease. In this connection a number of radium dosage graphs are inserted after the index. These give the number of mg. hours required to give 1000r under different conditions.

As regards the treatment of malignant disease of different parts of the body, the whole field is adequately

There are sections on Teleradium Therapy and new

Manchester point of view, this book is an admirable production; for apart from suggesting a line of advance through hostile territory, it is replete with a description

of the ways and means.

It can be cordially recommended as a mine of information on all aspects of the subject and as well as for the clarity and conciseness of its presentation.

The publishers are to be congratulated on the reproductions of illustrations and the general get-up of the book. J. A. S.

MINOR SURGERY. FOR THE USE OF HOUSE SURGEONS, DRESSERS AND JUNIOR PRACTITIONERS.—By C. Fieming, O.B.E., M.Ch., F.R.O.S. With a chapter on 'The Administration of Anssethetics'. By H. N. Webber, B.Ch., D.A. Twentythird Edition. 1946. J. and A. Churchill Limited, London. Pp. vili plus 408. Hinstrated. Pales 448. London. Pp. vill plus 406. Illustrated. Price, 14s.

An old friend appears again in a new edition. That it has passed through 26 editions with an average period of 3½ years between each of them shows how the book has been appreciated. Well-known men have thought it worth while to revise and bring out new editions. To older men the book is so familiar that one likes to keep a new edition as soon as it appears. The book is recommended to all students and house surgeons in our country as they will always and house surgeons in our country as they will always find ready help in almost every instance when it is needed.

L. M. B.

FEAR .-- By M. P. Leahy, M.B., B.Ch., B.A.O. (Dub.). 1948. Research Books Limited, London. Pp. xvil plus 165. Price, 10s. 6d.

Arren losing a limb in the First World War Dr. Leahy was overcome by depression and fear. He acquired the technique of overpowering both.

In this little book he gives numerous case reports. In all of them he was successful in dissipating fear.
Obviously Dr. Leahy possesses an extraordinary
power of persuasion and suggestion without being aware of it.

The book is well worth reading.

D. G.

REPRODUCTION AND SURVIVAL.—By R. Christie Brown, M.B., M.S., F.R.C.S., F.R.C.O.G. 1948. Edward Arnold and Company, London. Pp. 108. Price, 6s.

In this little book Dr. R. Christie Brown talks as

a biologist to biologically inclined readers.

'Nature is so careful of the type, so careless of the single life.'

Reproduction is truly a marvel and with it are linked the twin sciences of eugenics and dysgenics. The range of the topics is vast in spite of the small size of the book.

The reader wonders if women and men made sterile by their anatomy and physiology should be helped

by their anatomy and physiology should be helped over the fence by medical science in A.I.H.? A perfectly legal and ethical operation might propagate sperms which ought to have perished because they failed to pass the 'interface' with their own activity.

Certain ancient peoples keen on eugenics exposed their naturally conceived and born offspring because the size and weight did not conform to standard. A.I.H. appears to be doing the apposite in the light of the information given by the author. This is a single example. The reader will find others.

A book well worth reading.

A book well worth reading.

D. G.

# BOOKS RECEIVED

1. Kemsol. Journal of the King Edward Medical School, Indore (with Mahatma Gandhi Supplement). Volume III, Number 1, June 1948. Edited and published by Dr. P. S. Vasavada, M.D., Editor-in-Chief for the Kemsol. Editorial Board, K.E.H., Medical School,

2. The Nation's Health: A Ten-Year Programme. A Report to the President by Oscar R. Ewing, Federal Security Administrator. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Price, \$1.00.

# Any Questions

## FIRST-AID TREATMENT OF SNAKE-BITE WITH SOAP SOLUTION

Sir,—A little more than a year ago the Indian Medical Gazette published one or two articles in which a soap solution of 200 cc. was advised as an effective cure for snake-bite. Several cases of such cures were also reported. The remedy appeared to be a sensational one. Could you tell me whether this matter has received any attention from scientists and doctors? Should there be further reports or scientific investigations on this matter could you kindly let me know what they are? The locality from which I write is infested by snakes and the information, if true, would be of the greatest utility.

C. KRISHNASWAMY, Superintendent.

INTERMEDIATE COLLEGE, SHIMOGA (MYSORE).

(An article entitled 'A suggested first-aid treatment for cobra bite with carbolic soap solution' by M. L. Ahuja and A. G. Brooks was published in the *Indian* Medical Gazette, 90, 461-463. 1945.

The following extract from an article on 'Magnesium sulphate and carbolic soap as antidotes in snake-bite' by P. Agerholm Christensen and Mara de Waal. South African Med. Jour., 27th Sept., 1947. p. 680-1, will be of interest in this connection:

In view of their experimental results, Ahuja and Brooks recommended the use of a 5 per cent solution of carbolic soap as a first-aid treatment of cobra bite. They injected 1 cc. of a 10 per cent solution into human volunteers and found that it caused a slight burning pain of short duration, followed by redness, swelling, and induration, but state that no inconvenience was experienced after the first hour or two. They recommend local infiltration with the solution round the site of the bite in volumes up to 5 cc. and stress that the soap solution is only of first-aid importance, cannot replace serum, but must be considered as an adjuvant to treatment with antivenene.

Our experimental results support this recommendation in cases of snake-bite caused by African cobras as a preliminary treatment when antivenene is not immediately at land.

Ahuja and Brooks have also published a short article in the April 1948 number of the Indian Journal of Medical Research showing that soap is equally effective against krait venom.—EDITOR, I.M.G.)

# Service Notes

APPOINTMENTS AND TRANSFERS

Dr. C. G. Pandir, an Officer of the Medical Research Department, is placed on foreign service under the Indian Research Fund Association with effect from the

31st July, 1948.

Doctor A. C. Kapur, Additional Civil Surgeon, Tibet and Bhutan, is appointed Civil Surgeon, Tibet and Bhutan, with effect from the forenoon of the 20th July,

1948.

Dr. A. K. Thomas is appointed temporarily to the post of Medical Assistant at the Central Research Institute, Kasauli, with effect from the 21st September,

LEAVE

Lieutenant-Colonel M. K. Kelavkar, O.B.E., Drugs Controller, India, was granted leave as follows:—

I. War concession leave of average pay from the 13th July, 1948, to the 1st August, 1948, and from the 6th August, 1948 to the 15th August, 1948; and

II, Leave on average pay for the 16th August. 1948.

In partial modification of previous notification Licutenant-Colonel C. K. Lakshmanan, Director, All-India Institute of Hygiene and Public Health, Calcutta,

India Institute of Hygiene and Public Health, Calcutta, was granted leave on average pay from the 4th May, 1948 (afternoon) to the 14th July, 1948.

Major G. S. Chopra, Alr.o., formerly Deputy Assistant Director-General, Medical Store Depot, Lahore Cantt., was granted leave on full pay for 7 days combined with extraordinary leave for 21 days with effect from the 23rd June, 1947, with permission to prefix Sunday, the 22nd June, 1947.

Captain K. A. De'Rozario, Deputy Assistant Director-General (Medical Service), Medical Store Depot, Madras, was granted leave on average pay for 21 days with effect from the 25th August, 1947, to 14th September, 1947, and in continuation thereof, leave on halfber, 1947, and in continuation thereof, leave on half-average pay for 2 months and 8 days from the 15th September, 1947 to 22nd November, 1947 (hoth days inclusive).

Mr. B. N. Savant, Assistant Depot Manager, Medical Store Depot, Bombay, is granted leave on average pay on medical certificate for 2 months with effect from the 10th August, 1948.

Mr. D. A. Rama Wariyar, Depot Manager, Medical Store Depot Madager is reported leave on average pay.

Store Depot, Madras, is granted leave on average pay for 6 weeks with effect from the forenoon of 27th September, 1948.

## RELINQUISHMENT

Dr. A. K. Thomas, Officer on Special Duty' in the Ministry of External Affairs and Commonwealth Relations, relinquished charge of his post on the afternoon of the 20th September, 1948.

# Publishers' Notice

Scientific Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles are entitled to receive 25 reprints gratis; additional reprints can be obtained on payment. No reprints will be supplied unless contributors ask for them at the time of submitting their manuscripts.

The preparation of reprints entails rearranging the type, so that there is often a delay of a month or more, after the publication of the Gazette, before the reprints are ready. If reprints are not received within two months of the Gazette, contributors should write

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The Editors of The Indian Medical Gazette cannot advise correspondents with regard to prescriptions, diagnosis, etc., nor can they recommend individual practitioners by name, as any such action would constitute a breach of professional etiquette.

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# Original Articles

# BACTERIUM TYPHI-MURIUM BAC-TERÆMIA CAUSING FATALITY IN A CHILD

By J. F. FREEMAN P. N. BARDHAN, FRCPE.

and

B. G. BAMFORD

Pathologists in the Indian Army Medical Corps

Bacterium typhi-murium, commonly known as Bact. artrycke, is a natural pathogen of rodents; it causes a typhoid-like disease, particularly in mice. In man it causes an acute gastro-enteritis. It has also been known to cause infection of guinea-pigs, parrots, sheep, turkeys, chicks, pigeons, canaries, ducks and duck's eggs, but so far as is known it has not yet been recorded as having caused a fatal bacteræmia in human beings. The following case report therefore merits publication.

Case report.—A child of four months, generally breast-fed, had acute diarrhæa and vomiting suddenly on 14th July, 1947. The recovery was, however, quick and apparently complete by the 17th. The family commenced a 48-hour railway journey the next day for a transit camp near Bombay, and in the train the child had what was described by the parents as trouble-some vomiting. On arrival at destination on the 20th, the child was apparently better, and it continued to stay in the camp with its parents under supervision by the army medical authorities. On the 22nd, at 0400 hours, it became ill suddenly. It had severe convulsions and when admitted into the neighbouring military hospital at 0800 hours, it was comatose.

The other findings noted on admission were a temperature of 101.6°F., a pulse rate of 160, and a respiration rate of 40 per minute. Convulsions continued to repeat themselves, and the head was drawn to one side, there was twitching of the hands and the feet, and some shaking of the head. The anterior fontanelle was depressed, other signs of dehydration such as a dry tongue, a dry skin, and sunken eyes were also present. There was no rigidity of the neck, the knee jerks were noted as normal, the abdominal reflexes were considered as doubtful, Kernig's sign was absent, and the plantar reflexes were flexor. On the whole the neurological features were considered to be of negative value and this conclusion, though faulty (vide infra), was not recognized as such either at the disease.

Leucocytes were 4,850 per c.mm. with neutrophils 1,600, lymphocytes 2,958, monocytes

194, and eosinophils 98 per c.mm. The stool during the course of the day was not abnormal. Several blood films were examined for malarial parasites during the illness with negative result. Treatment was essentially symptomatic and dehydration was met with a continuous intravenous glucose saline drip, the right saphenous vein being cut down upon and the needle tied in situ. From 1700 hours penicillin was given in three-hourly doses of 1,500 units, continued till just before death. On the first day the only other treatment was grain 1/8 of phenobarbitone to control convulsions.

23rd July.—Dehydration had been corrected and the glucose saline drip was discontinued. Other physical signs were unchanged, and the temperature ranged between 103 and 104°F. Mepacrine methsulphonate 0.025 gm. was injected intravenously, but with no visible effects. The phenobarbitone repeated this day failed to control the convulsions, and one dram of paraldehyde achieved the result.

24th July.—The child developed four bright red spots on the right side of the face and these were taken to be rose spots of enteric fevers. The general condition was unchanged and there was no appreciable alteration in the physical signs. The child was nearly comatose all the time, and the convulsions were now attended with cyanosis, to correct which oxygen was administered through a nasal catheter during the fits. Paraldehyde was repeated in the same dose at 2200 hours.

25th July.—Temperature 102°F., the urine had a trace of sugar, an occasional pus cell, and an epithelial cell. Cheyne-Stokes' breathing commenced in the afternoon, the child went downhill rapidly, and expired at 2015 hours.

The autopsy was performed at 1100 hours the next day and the report in part reads as 'No evidence of dehydration, nutrifollows: tional state good, no adenopathy, no rash, icterus or hæmorrhage; pupils dilated but equal, external orifices normal. Heart normal, lungs showed hypostatic congestion, intestinal mucosa was congested especially the last three feet of the ileum, Peyer's patches showed some swelling and circum-injection, mesenteric glands were enlarged and one was particularly large in the ileo-cæcal region, liver and kidneys were congested, the spleen was enlarged with cut surface diffluent; the head showed no injury, there was extensive purulent exudation over the vertex and the base of the brain deep to the meninges; the brain was soft and friable. Smears from this pus showed numerous gramnegative bacilli, while culture from this pus and from the spleen pulp, the heart's blood and from the intestinal contents gave a growth of Bact. typhi-murium. The death was due to Salmonella septicæmia.'

Discussion.—The illness ran a course which is not uncommon in acute gastro-enteritis; the

apparent cures were merely phases in the same illness. Had the rail journey not been undertaken, the outcome of the case might have been more fortunate. On final admission into the hospital, it would appear that serious cerebral or intra-cranial damage was not suspected in spite of several presenting features. Coma, convulsions, twitchings and head shaking were all indications for performing a lumbar puncture which would have revealed the more serious part of the illness. The flexor plantar response in a child of four months is abnormal. In the first eight weeks of life 92 per cent of children give an extensor response (Monrad-Krohn, 1945). And again The plantar reflex, however, assumes the extensor distribution in the first year or so of infancy...' (Holmes, 1946). With achievement of control by the cerebral cortex through the pyramidal tracts over the spinal reflex, the extensor reflex gradually changes to flexor plantar reflex of the adult by the third year of life, by which time all children have learnt to walk and the cerebral control has become established. A plantar reflex in an infant therefore has nearly the same significance as an extensor one in an adult, and should have in this case roused suspicion of cerebral damage, even if the other presenting features could probably have been attributed to some other illness. Of course it is doubtful if a correct diagnosis at this late stage of the illness would have allowed sufficient time for effective treatment to have been undertaken The four spots on the face were probably part of the bacteræmia, and the abnormalities in the urine are to be explained by the same cause. The exhibition of mepacrine, if not quite correct, can, however, be justified in a country like India where malaria is the greatest mimicker, and the clinical picture as in this case is sometimes simulated by malaria caused by Plasmodium falciparum (malignant malaria). The case should have received a trial of treatment by sulphaguanidine.

Bacteriological studies.—The bacterium isolated from the heart's blood was identical with those obtained from the other sources mentioned above.

Morphology.—Gram-negative motile bacillus growing in all common media.

Biochemistry.—Acid and gas were produced in glucose, mannitol, arabinose, inosite, xylose, sorbite and maltose. Lactose, saccharose, adonite and inulin were unchanged. Indolé was not produced. not produced.

Serology.—A slide agglutination showed marked reaction with Bact. para. B serum and to a less extent with para. A and typhosum, the O serum being used in each case. Dreyer's test showed agglutination to the following titres:

The conclusion was that the unknown organism, X, had, probably the somatic antigen of the groups to which the three above organisms respectively belonged; a reference to Kauffmann White scheme (the KW scheme) showed these groups to be A, B and D.

An absorption test was then done. The O anti-serum of Bact. para. B titred to 250 was first absorbed with the O antigen of X, and then put up against Bact. para. B O antigen, but no agglutination resulted proving that all the antibodies were used up by the O antigen of X. A similarly absorbed serum was then put up against the O antigen of X, and again there was no agglutination. The O anti-serum of Bact. para. B titred to 250 after absorption with the O antigen of X had therefore no agglutinin left to agglutinate either its homologous antigen (Bact. para. B antigen) or the O antigen of X; in other words the somatic antigens in the unknown organism were identical with those of Bact. para. B. From the KW scheme these somatic antigens are IV, V and XII.

# Identification of the flagellar antigen

As X was a motile organism it must have a flagellar, antigen also. The organism was plated out and six of the colonies seeded into broth; of these, four were agglutinated by the H antigen of Bact. choleræ surs var kunzendorf, which organism, it may be mentioned, is monophasic, existing in phase II only, the non-specific phase and containing the flagellar antigens 1 and 5. The other two colonies were likely to be in the specific phase I. The phase I antigen of X from the two colonies was then put up for agglutination against the phase I or specific phase anti-sera of all the nine members of group B, and only the anti-serum for Bactityphi-murium agglutinated to the diagnostic titre of 250, proving that the X phase I antigen of Bactines identical with the phase I entigen of Bact was identical with the phase I antigen of Bact. typhi-murium. This from the KW scheme was found to be i. It was by now clear that X was a biphasic organism and was probably Bact typhi-murum. Further absorption tests were then performed as under:

1. Bact. typhi-murium H phase I anti-serum titred to 250 absorbed with

X phase Lantigen

ual states (16°

to sall the versus. The challenger will be

No agglutination.

2. Bact. typhi-murium H phase I antiserum titred to 250

absorbed with

X phase I antigen

X. Haphase Lantigen as Mo agglutination and

This proved the identity of the H phase I antigen in X with that of phase I antigen in Bact. typhi-murium which is i.

Identification of the phase II antigen

1. Bact. typhi-murium var. binns H phase II anti-serum titred to 250

X H phase II antigen ... agglutinated to 250, the diagnostic titre, proving that X could be agglutinated by the agglutinins in Bact. typhimurium var. binns H phase II anti-serum. This organism is known to be mono-phasic, existing in phase II only and contains the flagellar antigens 1, 2 and 3, vide the KW scheme.

2. Bact. choleræ suis var. kunzendorf H anti-serum titred to 250

#### veisus

X phase II of H antigen . . . agglutination to 50 only, showing that X can only be partially agglutinated by Bact. choleræ suis var. kunzendorf H anti-serum; in other words the flagellar antigens were only partially common to the two organisms. in

'3. The finalizing of the identification was performed by the following two absorption tests:--

"(A) Bact. typhi-murium var. binns H phase II anti-serum

absorbed with

X phase II H antigen

- '} versus 11 115

Bact. typhi-murium var. binns H phase II antigen . . . . No agglutination.

(B) Bact typhi-murium var. binns H phase II anti-serum

, 'absorbed with

X phase II H antigen

veisus

X phase II'H antigen . . . No agglutination. In both instances the agglutinins were completely absorbed, and this proves the identity of phase II antigens of X with phase II antigens of Bact typhi-murium var. binns, that is 1, 2 and 3. The organism has therefore the somatic antigens IV, V and XII, flagellar phase I antigen i, and flagellar phase II antigens 1, 2 and 3. These are the specific properties of Bact. typhi-murium, vide the KW scheme.

Summary

A fatal case of Salmonella bacteræmia in a child is described. The case notes are discussed and a common enough fallacy in the interpretation of plantar reflex analysed. Autopsy report is included. Studies on the organism, causing death is detailed, proving it to be Bact. typhimurium. '

Thanks are due to the authorities of the British Military Hospital at Deolali, for allowing access to the case records, to the DMS in India for permission to report the case, to Lieut-Colonel M. Ahuja, Director of the Central Research Institute at Kasauli, for helpful criticism, and to Lopamudra Bardhan for help in the preparation of the paper.

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Monrad-Krohn, G. H Clinical Examination of the (1945). Clinical Examination of the Nervous System. Paul B. Hocher, Inc., New York.

#### SEPTIC SORE THROAT

By S L. MALHOTRA, MRCP. (Lond), BCH. (Eng) (From the Medical Department, Great Indian Peninsula Railway, Jubbulpore)

THE condition commonly known as septic throat or epidemic sore throat deserves special. importance from the general practitioner as like no other common condition it is so frequently missed and even mis-diagnosed. This is particularly unfortunate because it is amenable to a simple and reliable form of therapy. Septic sorc throat is an acute streptococcal infection with a fairly clear-cut clinical picture.

The onset is sudden. There is usually chilliness, headache and rise of temperature. Most patients complain of vague body pains and malaise. In fact malaise and prostration were constantly complained of by all the patients' in the present series. Most of the patients were apprehensive and nervous and suffered from insomnia to a more or less extent.

Pain in the throat was complained of only by two (cases 2 and 9) and in both these the larynx was also affected; the rest of the series did not make any complaint about soreness or pain in the throat. Appetite is generally not impaired; only one patient in the present series complained of anorexia.

Physical findings are fairly characteristic. Face is as a rule flushed or even may show a scarlatiniform rash. In two (cases 9 and 7) of the cases there was puffiness present below the eyelids. Throat is acutely congested and usually shows a diffuse, thin greyish exudate, Swallowing may be painful in those cases in which the larynx is involved. In two (cases 3 and 9) of the cases there was a punctate rash on the palate. Lungs are as a rule not affected: the disease thus being only confined to the upper respiratory tract.

. Three (cases 2, 7 and 10) of the cases showed slight ædema over the extremities with pitting on pressure. These three cases also had albuminurea with hyaline casts. In two cases 4 and

5) cases in the present series there was involvement of the knee joints.

# . Course and prognosis

If untreated the condition may be prolonged—fever, malaise and headache lasting as long as 20 days. Confusion is made mostly with typhoid group of fevers. Under treatment the prognosis is excellent. Follow-up of the present series has not been sufficient to justify any conclusion as regards freedom from complications. But it is possible that some of the neglected cases may develop nephritis.

#### Treatment

The sulphonamides have not been very successful in the treatment of this condition. Sulphadiazine was the agent employed. The disease took its own course. In fact this treatment increased the malaise and prostration and thus made the patients more miserable.

Penicillin controls the condition almost dramatically. In the penicillin series of cases there was not a single failure. Temperature came down on the 1st day and malaise and prostration also disappeared soon. It was not necessary to prolong the treatment for more than 72 hours. In this series two injections a day of 100,000 units each have been used. Most patients felt completely relieved after the second dose but for safety's sake all of them were given the full course of six injections lasting over a period of 3 days. Of the three cases showing puffiness of the face and ædema of feet one was put in the sulphonamide series and the other two in the penicillin series. The penicillin case showed complete disappearance of the ædema on the 2nd day whereas the sulphonamide case showed no signs of subsidence even after 5 days' adéquate chemotherapy.

#### Case records

Case 1.—P. C., male adult, aged 30, was first seen on 27th February, 1948, with a history of continued fever, malaise and extreme prostration. Temperature on admission was 102°F. Systemic examination showed acute congestion of the throat, with a thin greyish exudate. Fauces flushed. Cervical lymph nodes enlarged and tender, polymorphonuclear leucocytosis (10,000 cc. with 75 per cent polys.).

No abnormality detected in any other system. The patient was put on sulphadiazine regimen and given 24 gm. of the drug over a period of 6 days. His general condition improved on the 5th day of treatment. He was discharged cured after 11 day's hospital treatment.

Case 2.—J. S., male adult, aged 43, was admitted to the hospital on 25th February, 1948, in a febrile condition. Three days previously he had contracted a severe cold and cough. A day later he developed a temperature with chill and

felt vague pains all over the body with extreme degree of malaise.

Examination revealed an acutely ill man with fever of 103°F. The face and upper part of chest flushed, puffiness below the eyelids, and edema with pitting on pressure over both the ankles.

Throat acutely inflamed with a diffuse yellowish exudate. Voice hoarse and laryngo-scopy revealed acute laryngitis. Swallowing was painful. Rest of the system examination was without any relevant findings. Urine alysis showed albuminuria with hyaline casts. The optic fundi had no abnormal appearances.

Patient put on penicillin treatment receiving 100,000 units morning and evening. On the second day of his treatment he was up and about. Albuminuria disappeared and the ædema subsided completely. Penicillin was continued for another day. Patient was discharged cured after 4 days of hospital treatment.

Case 3.—M. L., adult male, 22 years, was first seen on 3rd March, 1948. He became ill on the 2nd March with sudden rise of temperature, a bad headache and extreme degree of malaise.

Examination revealed a temperature of 103°F. He had a petechial rash over his forearms involving also the palms. Throat showed acutely inflamed pharynx with a punctate rash over the palate. Had a leucocytosis of 12,000.

He was put on penicillin treatment 100,000 units morning and evening by intramuscular injection. On the second day of treatment the patient felt altogether different. Malaise disappeared and temperature subsided. Penicillin was discontinued on the 3rd day.

Case 4.—B. D., 27 years, woman, was first seen on 3rd March, 1948, with a complaint of fever, pain on swallowing, pain and swelling of both the knees of 2 days' duration. Examination revealed a temperature of 102°F. The knee joints were painfully swollen and the right knee showed a sterile effusion. There was no clinical evidence of effusion in the left knee. Throat examination revealed a very sore pharynx covered with a thin dirty grey exudate.

Patient was put on sulphadiazine regimen and after 36 hours of sulphadiazine therapy both the local and general condition deteriorated. Replacement of sulphadiazine with penicillin led to rapid improvement and in 3 days the patient was completely relieved.

Case 5.—R. L., adult male, 28 years, first seen on 10th March, 1948, presented a nearly identical picture as case 4. Put on penicillin treatment 100,000 units twice daily. His temperature came down after the first dose. Malaise disappeared and no clinical evidence of effusion could be detected in the knee joints on the 3rd day of the treatment.

Case 6.—S. L., adult male, 29 years, first seen on 4th April, 1948, with fever and marked prostration of 5 days' duration.

Examination revealed a temperature of 103°F. Face flushed. Appetite good. Pharynx was acutely congested and covered with a dirty grey exudate. System examination did not reveal any relevant abnormality elsewhere.

He was put on a sulphadiazine regimen and received 24 gm. of the drug in six days. The condition showed no improvement at all. On the other hand patient felt more depressed and prostrated. On 10th April, he was put on penicillin G. 100,000 units morning and evening. His temperature came down next morning. The patient was up and about on the second day of penicillin treatment.

Case 7.—R. S., a man aged 30, was first seen in April 1948, with the following history:—

Five days previously he suddenly developed high temperature with a chill and felt extremely depressed. His family doctor gave him an injection of quinine after which the temperature came down a little but did not subside. He was later put on paludrine on the 7th April, which he had been taking until he saw me. On the 6th April, he noticed that his hands as well as feet were slightly swollen.

Examination revealed slight ædema over both the hands and feet. He had slight puffiness below the eyelids. Temperature 102°F. Throat—acutely inflamed pharynx. Urine analysis revealed albuminuria with numerous hyaline casts and occasional R.B.C.

Optic fundi were normal. Paludrine was discontinued and patient put on a regimen of penicillin. He showed a dramatic response—fever and odema subsided completely. He was

declared cured after 4 days' observation and treatment.

Case 8.—S. L., 30 years, male, first examined on 8th July, 1948, with the following complaints:—

- (i) Fever-12 days without intermission.
- (ii) Extreme depression—since the onset of fever.
  - (iii) Apprehension and insomnia.

Examination revealed a temperature of 103°F. Throat acutely congested. There was a dirty greyish exudate on the pharynx. System examination of lungs, heart and abdomen showed no relevant abnormality:

He was put on sulphadiazine 2 tablets every 4 hours after a loading dose of 4 tablets. This treatment was discontinued on the 4th day as there was no improvement in the patient's condition and he felt more depressed and miserable. He was put on penicillin G. 100,000 units twice daily. There was a dramatic improvement in his condition on the second day of treatment.

Case 9.—P. C., 50 years, male adult, first seen on 20th June, 1948, with history of fever of 5 days' duration; extreme degree of malaise; scarlatiniform rash and sleepiness. His family doctor treated him with quinine injection and later on with diaphoretic remedies without any appreciable improvement.

On examination the temperature was 104°F. Patient felt extremely depressed, restless and apprehensive. He had a marked scarlatiniform rash. Palate showed punctate hæmorrhages. Pharynx acutely inflamed and 'covered with a sticky dirty greyish exudate. Breath was offensive, voice was hoarse and laryngoscopy

instituted	Case number	Duration of symp- toms before treatment instituted	Temperature, °F.	Leucocytosis	Treatment	Result n'
10	11 12 13 14 15 16 17 18 19 20 21 22 23	2 ", 1st day 5th ", 2 days 1st day 1st ", 4th ", 2 days 2 ", 3 ", 1st day 3 days 6 ", 3 ", 3 days	101 101 100 101 100 99 100 101 101 100 100		Penicillin Do. Do. Do. Sulphadiazine Do. Penicillin Do. Sulphadiazine Penicillin Do. Sulphadiazine	No response. Penicillin substituted after 3 days. Cured. Do. Do. Do. Do. No responded but response was slow. Do. No response after 4 days. Cured. Do. No response. Penicillin substituted after 3 days. Slow response. Cured. No response. Penicillin substituted after 3 days. Cured. Do. Cured. Do.

showed acute laryngitis. System examination did not reveal any abnormality elsewhere.

He was put on sulphadiazine and received 12 gm. of the drug in three days. The drug was discontinued on the 4th day as he showed no improvement. On the 4th day he had 101°F. At this stage he was put on penicillin G. 100,000 units twice daily. The very first injection produced a dramatic response. His temperature came down and he remained afebrile subsequently. Depression and malaise disappeared and he was up and about gratefully. It was considered advisable to give him the full course of 3 days' penicillin therapy in spite of the good response to the first dose.

# Conclusions

- 1. Twenty-six cases of epidemic sore throat are reported. Nine case histories are reviewed to serve as a basis for discussion.
- 2. Clinical picture of the condition is summarized.
- 3. Treatment is discussed. There is ample evidence that penicillin given as infrequently as twice daily is eminently effective in this condition. Sulphonamides have, as a rule, failed to produce a response.

#### **CHOREA GRAVIS**

By G. S. MOHAPATRA, M.B., B.S.

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THE experiments of Poynton and Pain and the subsequent repetition and confirmation of the same by Beaton, Ainley Walker and Beattie have conclusively proved chorea to be of rheumatic origin. The essential pathological change in chorea consists in a meningo-encephalitis in which the pia-arachnoid, cerebral cortex, the caudate nucleus, the red nucleus and the superior cerebellar peduncles are affected. The symptoms of chorea are usually associated with other manifestations of rheumatism. The more severe are the symptoms of chorea, the more frequently are the associated manifestations of rheumatism observed. Thus, it has been remarked that in chorea gravis the signs of endocarditis are lacking. Chorea gravis is a severe of chorea where the symptoms are all exaggerated. Chorea as the only and first manifestation of rheumatism is not frequently met with and much less so is chorea gravis.

The following case observed and treated by the writer is an interesting one from a clinical point of view: Case note

P., a girl, aged 14, was admitted into hospital on the 16th September, 1948, with the following complaints:—

- 1. Violent involuntary movements of the whole body including both the extremities—duration, 15 days.
- 2. Inability to stand, to lie down in bed or to walk—duration, 7 days.
  - 3. Sleeplessness—duration, 5 days.
- 4. Inability to speak or swallow—duration, 5 days.

Family and personal history revealed no evidence of rheumatic disease. The girl came of a poor labouring class family.

Onset was very abrupt. The patient in the midst of her routine household work suddenly fainted and as she regained her senses the peculiar movements were observed by her people, which in course of 48 hours became quite violent.

Clinical findings.—As the patient was brought before the writer she was placed in a 'kot' well protected from all sides and supported by two of her relatives. On release of support her body and limbs violently struck the protective bars round the bed. It was not possible to make the patient stand or walk without support—so severe were the movements of the limbs and body. The involuntary movements were extremely irregular both in time and nature. Voluntary movements to cover any fault were almost always unsuccessful. In the face grimaces were frequently marked and smacking of the tongue and palate was often heard. Expression of the face very frequently changed from grimace to smile and vice versa. When asked to show the tongue there was failure in co-ordination of opening of mouth and protruding of tongue due to ineffective sequence of voluntary movements and after several attempts the tongue was protruded suddenly and was put back to one side of the mouth. Speech was impossible, all attempts on the part of the patient failed. Deglutition was very difficult, in fact this complaint was mainly responsible for bringing the case to the hospital.

Loss of power either in form of paresis or paralysis was absent.

There was no impairment of sensation and sphincters were not affected. Skin reflexes were normal and knee-jerks were rather diminished. Excepting chorea there were no other signs of rheumatic disease. No murmurs or adventitious sounds were detected in the heart. Neither the tonsils were enlarged nor were there any articular or skin affections.

Psychical disturbance was absent. In spite of such violent psychical disturbances, the patient appeared quite normal. There was insomnia, and she had very little sleep in the night.

Pyrexia was present, the temperature being 100.4°F. The pupils were dilated and equal on both sides.

Breath sounds were regular except at intervals when there was holding of breath for a time followed by a loud sigh.

Urine was scanty and high coloured but no abnormal contents were detected.

Blood examination: Total W.B.C. 15,000 per e.mm. R.B.C. 3,250,000 per c.mm. Differential, poly. 50 per cent, lympho. 39 per cent, L. mono. 6 per cent, eosino. 6 per cent, baso. nil.

Treatment.—The patient was put in a bed on the floor and was kept under constant watch to protect her from any injury. Considering the condition of the patient an injection of morphine 1/4 grain and hyoscine 1/200 grain was given intramuscularly. The effect was surprisingly poor, besides a little dulling of sensation there was almost no cessation of movements. Chloroform inhalation was resorted to at intervals and a mixture containing pot. bromide gr. 10, chloral hydras gr. 10, spirit of chloroform 15 m, syrup auranti 1 dram to one ounce of water was continued three times a day. The violent movements almost ceased in 72 hours, only twitchings of face and some sudden jerky movements of one leg or the other or one hand persisting. Aspirin in 10 gr. doses thrice daily was continued for about a week. The patient having regained normal speech, normal deglutition and gait left the hospital.

### Discussion

The case was obviously one of chorea gravis. Though abrupt onset is not rare, an abrupt onset of chorea gravis in a way described is a rare phenomenon. The degree of psychical disturbance depends probably on the mode of life the patient lives and the circumstances to which he or she is subjected in routine life. In the present case the patient lives in a quiet countryside far from any modern stress or strain.

The case, as observed from time to time, has been doing well and no abnormality in the action of the heart has yet been detected.

# SEROLOGICAL TECHNIQUE (contd.)

By S. D. S. GREVAL LIEUTENANT-COLONEL, late 1 M.S.

(From the Laboratory of the Serologist to the Government of India, School of Tropical Medicine, Calcutta)

### AUTOTHERAPY

# **AUTOHÆMOTHERAPY**

The immunological basis of this form of treatment is obscure. Some believe it to be purely a psychological effect.

5 to 20 cc. of blood are drawn from a vein and injected immediately, before clotting can occur; intramuscularly. It has been employed in chorea, urticaria, asthma and chronic dermatosis. Free blood in the tissues causes a febrile reaction.

#### AUTOSEROTHERAPY

20 to 40 cc. or more of blood are drawn and allowed to coagulate; the clear serum is then collected and put into 1 to 2 cc. ampoules.

The principle is the same as that of the autohemotherapy. There is, however, one advantage: in repeating the injection of the whole blood (taken from the patient every time) the contained therapeutic agent (whatever it be) is not constant, because it is affected by a previous injection; while in repeating the injection of serum the same therapeutic agent is given again.

In preparing the serum ampoules the technique of bacteriological sterility must be observed: the technique of surgical sterility will not do. Sterilized ampoules are filled individually with a 10 to 20 cc. syringe. Before commencing filling of the ampoule one drop of the serum is dropped on a blood agar surface (for erobic culture of a possible contaminant) and one drop introduced into glucose broth under a paraffin seal (for anerobic culture of the same contaminant). After finishing filling the ampoules the same two cultures are attempted from the few drops left in the syringe. The filled and hermetically sealed ampoules are incubated for 24 hours to see if any turbidity has developed. The turbidity indicates contamination and the ampoules must be destroyed.

# AUTO-URINARY PROTEOSE THERAPY

Isolation of the proteose.—The patient brings to the laboratory, in the morning, 200 to 300 cc. of urine, passed the same morning on rising. The sample is left in the refrigerator. In the afternoon the patient brings another sample passed during the usual daily activity. The two samples are mixed, if possible, in equal volumes.

400 cc. of the mixed urine are placed in a separating funnel and acidified with 25 per cent (by weight  $H_2SO_4$  until acid to congo red paper (which turns blue).

100 cc. of ether are added and mixed thus:
(1) Invert the funnel, agitate the contents gently, restore to original position and release pressure of the vapour by loosening the stopper. Repeat 3 times. (2) Agitate the contents briskly and release pressure. (3) Agitate the contents vigorously and release pressure. The funnel is left in the stand overnight.

The next day the proteose is found in the layer of ether on the top of the urine. The urine is run off and discarded. 120 cc. of absolute alcohol are added to the layer of the proteose in ether and the contents shaken. A

precipitate forms. The funnel is again left in the stand for a day.

The next day most of the supernatant mixture of ether and alcohol is removed from the top of the funnel by a pipette. The rest, about 20 cc., is shaken with the deposit and run into a test tube from which is poured into a centrifuge tube by instalments and centrifuged. The deposit of each instalment remains in the centrifuge tube while the supernatant fluid is discarded. The total deposit is washed with 10 cc. of fresh absolute alcohol (shaken up with the alcohol and the tube centrifuged again) and the final deposit obtained.

(The process up to this point can be undertaken in a chemical laboratory: The final deposit with a few cc. of alcohol can be sealed hermetically in an ampoule for despatch to a bacteriological laboratory where the rest of the process can be completed.)

The final deposit, freed from alcohol as much as possible by centrifuging, is suspended in 10 cc. of 0.35 per cent phenolized saline and incubated at blood heat for half an hour. Most of the deposit dissolves. The fluid is then passed through a small Seitz filter. The clear solution (5 to 6 cc. depending upon the size of the filter) is reckoned to be a 1 in 1,000 solution of the proteose. It is tested for sterility ærobically and anærobically.

Quantities are put up in 1 cc. ampoules as follows:—

1 in 1,000	3 to	4 ampoules
1 in 5,000		2 ampoules
1 in 10,000	• •	3 ampoules
1 in 20.000	• •	3 ampoules

(These ampoules can be sent to a physician from the bacteriological laboratory with the following account for instructions.)

The dose.—The solutions from the last two ampoules are used for scratch tests, thus: (1) On the arm make with the point of a sterilized pin 3 scratches  $\frac{1}{3}$  inch long and 1 inch apart. Blood should not be drawn but a visible cleft in the skin must be made. (2) On the top scratch deposit a drop of 1 in 10,000 dilution (with a platinum loop, probe or glass rod), on the middle scratch a drop of phenolized saline and on the bottom scratch a drop of 1 in 20,000 dilution. Rub in the fluid with the head of a sterilized pin—beginning with the middle scratch, proceeding to the bottom scratch and finishing with the top scratch. (3) Observe after 15 minutes, after 1 hour and next morning. A traumatic (or chemical, due to phenol) reaction if present is uniform along the scratch in all scratches. A specific reaction occurs according to the strength of the solution and is suggestive of urticaria, showing irregularity of outline.

If the dilution 1 in 20,000 does not produce any reaction, while the dilution 1 in 10,000 does, the former dilution provides the dose. 1 cc. (from another ampoule) should be injected, subcutaneously or intramuscularly, on the 1st and the 5th day. Later, 2 doses of the next stronger solution (1 in 10,000) should be given in the same way. Later still, 2 doses of the next stronger solution (1 in 5,000) should be given in the same way. Lastly, the strongest solution (1 in 1,000) should be given in the same way. Altogether 8 doses of 1 cc. are injected in 35 days.

If the dilution 1 in 10,000 does not produce any reaction, it provides the doses. A beginning is then made with a 1 in 10,000 dilution. On reaching the strongest dilution (1 in 1,000), then 3 to 4 doses (depending on availability) are given. Altogether 7 to 8 doses of 1 cc. are injected in 30 to 35 days.

A severe attack of urticaria or of respiratory embarrassment may follow if the skin test has not been carried out properly For these complications adrenalin is given in the usual dose, preferably twice in case of respiratory embarrassment. For further details see Serum Sickness.

Special features of the technique of isolation and use of the proteose.—The process is based on the one described by Oriel, G. H. (The Lancet, 19th August, 1933, page 406).

The points of difference are: (1) The ether soluble and alcohol insoluble substance from the urine is dissolved in normal saline instead of Evan's solution. The saline seems to answer the purpose very well. (2) Urine is collected after a period of rest and a period of activity. (3) The final solution is guaranteed free from bacteria and allied microscopic organisms. (4) The dose is based on skin reaction.

Evans' solution (buffered saline) is prepared, if desired, as follows:—

# Stock solution no. 1

NaCl	• •	50.00	gm
KH ₂ PO ₄ ···	• •	3.63	gm
Na ₂ HPO ₄ 12H ₂ O		14.31	gm
Water		1,000	cc.

Stock solution no. 2 Phenol, 4 per cent.

Mix 1 part of stock solution no. 1, 1 part of stock solution no. 2 and 8 parts of distilled water.

The solution is one of the commoner extracting fluids used in preparing extracts for studying allergy.

Therapeutic value of the proteose.—In some cases of lichen, chronic urticaria, recurrent

urticaria due to food and cold, asthma and leucoderma spectacular successes have been obtained. The improvement occurred with the first 2 injections.

Storage.—The ampoules are stored like vaccine ampoules. Flakes may appear in the 1 in 1,000 dilution in cold storage. The flakes dissolve at room temperature or in an incubator. The product may be stored for a year safely.

### **EOSINOPHILIC LUNG**

By S. RAJU AYYAR

Civil Assistant Surgeon, Tirukalikundram

Eosinophilic lung is an allergic disease of the respiratory system which has recently been recognized. It has been differentiated from bronchial asthma or early cases of pulmonary tuberculosis to the great relief of the suffering patients. For the past few years case reports have been published in the *Indian Medical Gazette* and other journals which have made me curious to observe cases coming to me here as asthma. From about 90 cases that have come to my notice during the past 24 months, I have selected 24 cases which have proved to be eosinophilic on my examination.

In my series, 12 cases gave a definite history of allergic manifestation. No age or sex appears to have any special proclivity for the disease. Duration of the disease is from several years to less than one year in this series. Commonly the symptoms appear gradually. There is always an unproductive cough followed by short breathlessness simulating that of an attack of asthma. In some cases the breathlessness is not very prominent or it may be absent altogether. There is always a low intermittent fever as a constant feature. The physical examination would reveal slight hyper-resonance with prolonged expiration and fine râles with a few rhonchi as in bronchitis. It is only the examination of a blood slide which gives the clinching evidence for diagnosis. Differential count showed a high percentage of eosinophil which ranges between 18 to 71 per cent. It may be of interest to note that the percentage of eosinophil has no relation to the severity of the disease as for instance in one of the cases of this series with a 40 per cent eosinophil, the symptoms were very very mild.

As regards the treatment, it is very simple as suggested in some of the journals. It is an administration of one of the several preparations of arsenic. The drug of choice is acetylarsan 3 cc. for adults and 2 cc. for children. Of course, in some cases I have tried mapharside 0.4 gm. intravenously (only for adults). This treatment is given once in 3 or 4 days or at

longer intervals and it gives great relief at the first injection. In all my cases there have been no untoward symptoms observed necessitating the withholding of the treatment on any score. Of course, the preliminaries of urine examination for albumin have to be done. In all from 12 to 14 injections have been given as a course. In the course of the observation of this series of cases, I have come across two cases with symptoms simulating pulmonary tuberculosis. I deal with them in detail for information. One of them is a vaisya youth of 22 years who consulted me for fever, slight unproductive cough, general weakness, inaptitude for work and even loss of weight. As is common, he had treatment for over a period of six months in various places by several quacks. The duration of the disease was said to be over a year. The temperature was about 99°F. in the morning and 101°F, in the evening. The right apex was dull on percussion with deficient air entry. He had an x-ray picture which showed an opaque area in the right apex. The blood picture showed 29 per cent of eosinophil. He was put on acetylarsan treatment and given about six injections. He became apyrexial with no cough and his general health was marvellously improved. He then started coming to me irregularly for some time and is now lost sight of.

Another case is that of a weaver who came to me for a carbuncle on the back (non-diabetic). He was operated upon and dressed. About the 7th day, he developed a slight fever, bad cough and a slight breathlessness. The local condition of the wound was very good. On examination of the lung, there were a few rhonchi and occasional râles and hyper-resonance on percussion. In his 32 years of life, he remembered several periodical attacks simulating this which naturally used to appear and disappear. The blood smear was examined and it was found to contain 17 per cent of eosinophil. Acetylarsan worked marvellously in his case with 4 injections. He became free from fever and cough. In the meanwhile the wound had healed. In all cases of this series other tests like x-ray examinations and examination of the blood would have added a good deal in confirming the diagnosis. Of course, routine stool examinations were done in all these cases by me and helminthic conditions excluded. Kahn and Wassermann tests were done as well as the differential count by the King Institute, Guindy, for me. Other examinations could not be carried out for want of equipment in these rural areas.

I am reporting this series of cases with my personal observations only with a view to stimulating others in the profession to take to scientific study of such cases in detail and save serious errors in diagnosis. Some of these cases

Details	οf	chepe	treated
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Num- ber	Name	Age	Sex	Duration	Eosinophil before treatment, per cent	Kahn and W.R. tests	Eosinophil after treatment, per cent	Drug used	RESULT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	Mrs. N	35 55 25 30 10 21 23 35 16 48 35 40 13 26 20 30 30 18	F.M. F.F.M.M. M. F.M.M. F.F.F.F.F.F.F.F.	14 months 12 " 8 " 18 " 12 " 12 " 36 " 48 " 48 " 6 " 24 " 36 " 24 " 36 " 24 " 60 " 84 " 60 " 84 " 60 " 81 " 81 " 81 " 81 " 82 " 83 " 84 " 85 " 86 " 87 " 88 " 88 " 88 " 88 " 88 " 88 " 88	21 17 37 20 18 14 35 32 40 18 62 18 72 13 26 17 33 42 19 13 58 16 46 20	Negative	32521223515152326732 Not sent	Mapharside  " Acetylarsan Mapharside  " Acetylarsan  " " " " " " " " " " " " " " " " " "	CD.  " " " " " " " " " " " " " " " " " "

would have been mistaken for pulmonary tuberculosis.

My thanks are due to the Director, King Institute, Guindy, for very kindly examining the slides and doing Wassermann and Kahn tests in all cases.

[Presumably CD.=Cured and Rd.=Returned.— Editor, I.M.G.]

# CONGENITAL PERFORATION OF THE AORTIC SINUSES OF VALSALVA

By M. ABDUL HAMEED, M.B., M.R.C.P. (Lond.)
Professor of Pathology, Lucknow University

The above condition is extremely rare, as according to Abbott (1927) only 11 cases of congenital aneurysm or perforation of the aortic sinuses of valsalva have been described in literature. Recently I came across two hearts which showed the above congenital defect. The full clinical notes of one of them were available as he was a patient in the King George's Hospital, Lucknow.

### Case 1

A male, aged 25 years, was admitted to the hospital with the complaint of breathlessness on exertion and palpitation. He gave a history of rheumatism in his boyhood but the history was not well defined. He was also having a moderate degree of temperature for about a month. On examination the heart was

found enlarged (apex beat in the sixth interspace  $1\frac{1}{2}$  inches external to the nipple line) with a soft systolic murmur, mostly confined to the region of the apex. There was also a soft diastolic murmur best heard at the site of the aortic valve (third costal cartilage left side) conducted downwards.: The second sound in the aortic area was audible. Peripheral pulsation was also present but not to a marked degree. Pulse showed the water-hammer character. Blood pressure was 125/0. Spleen was enlarged. Liver not enlarged. Initial W.B.C. count 10,000 per c.mm. with polymorphs 76 per cent. Blood culture was sterile. Wassermann reaction was completely negative. Urine did not show any red blood cells. Skiagram showed enlarged bootshaped heart with no aneurysmal dilatation of the aorta. Rheumatic endocarditis with incompetence of aortic valves was diagnosed. The patient was put on big doses of salicylates but there was no remission in temperature. Penicillin was then given for a fortnight in the doses of 30,000 units every three hours. There was no relief in the temperature. One day the patient became rest-less and complained of pain in the side of the chest and also brought out a little blood. : A lung infarction was suspected. Next day he developed signs of consolidation of lung and was treated with cibazol and penicillin. A day later, he suddenly became dyspnœic and cyanosed, with collapse, and died.

Post mortem.—Lung showed consolidation of the upper lobe of the left side and was red in colour. Spleen was chlarged. No infarct in the spleen or kidney. . The left ventricle of the heart was markedly enlarged and the aorta was small in comparison to the normal size. Width of the cut aorta was 13 inches. On opening the left ventricle and the aorta, two cavities with calcareous lining were found at their junction. These two cavities were communicating with each other through a small hole. The right-sided cavity was also communicating with the aorta through a circular opening lying between the anterior cusp and the opening of the right coronary artery. The left-sided cavity was similarly connected with a small opening lying between the left posterior aortic cusp and the opening of the left coronary artery. The right aneurysm was pointing towards the right ventricle in its upper part, while the left was pointing towards the left ventricle. Below the left posterior aortic cusp there was another oval slit. This slit was covered with ante-mortem clot. The opening of the slit was directed towards the left ventricle and was probably responsible for the aortic regurgitation and for the temperature in life (subacute bacterial endocarditis). The mitral valve did not show any disease and there was no enlargement of the left auricle. Therefore, it was concluded that the patient had congenital aneurysm of the anterior and left posterior sinuses of valsalva and they were in communication anteriorly. The left-sided aneurysm had further made another opening into the left ventricle and showed subacute bacterial endocarditis (figure 1, plate XXXIII).

#### Case 2

A man of 30 met with an accidental death. The heart was removed by the police surgeon and sent to us for opinion. The heart was of normal size. On opening the heart a big tumour-like swelling was found in the interventricular septum. On further dissection it was found out that there was an opening in the anterior aortic sinus of valsalva which had produced an aneurysm in the interventricular septum. This aneurysmal dilatation was intercepted in the middle by a constriction with a small hole in it. No other details of the case were available (figure 2, plate XXXIII).

### Comment

Most of such defects are found in the anterior aortic sinus. They are usually associated with an opening in the anterior part of the interventricular septum, but cases have been described specially by Hark (1905) in which no such defect existed in the interventricular septum. A case was published by Goehring (1920) in which the remarkable feature was that the congenital deficit lay in the right posterior sinus and it finally ruptured in the right auricle. No reference in the literature is found in connection with the congenital perforation or aneurysm of the left posterior aortic sinus. It is remarkable

in case 1 that two such defects were present each in the anterior and left posterior aortic sinuses. In case 1 the right side aneurysm had pointed itself into the right ventricle below the pulmonary cusp but did not perforate there. Possibly the cause of this non-leakage was that the current of blood from the right nortic sinus found communication through the heart muscle covering the base of the norta into the left aortic sinus. Whether the aneurysm in the left aortic sinus was a result of the condition on the right side or it was a defect de novo is very hard to say. The smoothness and roundness of these openings suggested that the two openings in the two sinuses were congenital. The third opening just below the left posterior aortic cusp might have been an acquired one, as its margins were slightly everted. It communicated with the left ventricle and showed vegetations (subacute bacterial endocarditis). The opening, with vegetations over it, can afford an explanation for the temperature which the patient was running and has also been responsible for the signs of aortic incompetence in the patient. The history of rheumatism in this case was indefinite and it could not have been a rheumatic heart as the mitral valve was quite healthy and the left auricle did not show any hypertrophy.

Casè 2 showed only an aneurysm in the anterior aortic sinus and this-aneurysm had pointed towards the interventricular septum, but did not perforate it either way. The condition had given rise to a bulge in the interventricular septum which presented itself like a tumour of interventricular septum. Death was probably caused by the coagulation of blood in these aneurysmal cavities and a subsequent occlusion of the right coronary artery by the thrombus. In both these cases there was no defect in the development of the interventricular septum. The development of these aneurysms of the aortic sinuses is not well understood embryologically. Probably, it is due to an arrest of development of the aortic septum at a stage when semi-lunar cusps are not formed. Semi-lunar cusps which are developed from the endocardial cushions, in such cases, form at a later stage. Sometimes a defect is also left out in the interventricular septum which also develops from a downward continuation of the fused lateral endocardial cushions (distal-bulbar septum). It is difficult to give any embryological explanation for similar defects in right posterior sinus. It can explain the defect in the anterior and left posterior sinuses, as was present in case 1.

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# THE ROLE OF VITAMIN B, IN THE TREATMENT OF DIABETES

By J. P. BOSE, M.B., F.C.S. (Lond.)

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Introduction.—Vitamin B₁ is widely distributed in nature. It is particularly abundant in whole wheat, enriched bread, whole cereal grains, legume seeds, certain fruits and vegetables, yolk of eggs, liver and meat, specially pork. In refined cereals vitamin B₁ is negligible.

Deficiency in vitamin B₁ usually occurs as a result of the cereal grains being highly polished or adulterated and also from want of fruits and other articles of food, owing to high prices.

Vitamin B₁ is thermolabile and is destroyed in prolonged cooking above the boiling point of water. Since it is readily soluble in water, there is also a fair amount of loss (about 50 per cent) when foods containing it are boiled at high temperature and the water thrown away. Vitamin B₂, however, is less sensitive to heat than vitamin B₁.

During the process of milling, there is a considerable loss in the vitamin  $B_1$  content of the cereal grains and pulses.

In view of the above remarks, it is apparent that vitamin B₁ deficiency is particularly common in this country. Then, again, unlike other vitamins, this vitamin is found lacking unexpectedly hence the frequency of a deficient state in thiamin appears to be more probable than that in the case of other vitamins.

Cases suitable for vitamin  $B_1$  therapy.—The quick improvement or otherwise of a diabetic patient as a consequence of vitamin B, therapy depends on whether there is vitamin B₁ deficiency or not. The symptoms of a mild or moderate degree of thiamin deficiency in cases of diabetes are often vague and rarely receive clinical recognition. If these cases are carefully looked into and vitamin B, therapy given, extremely good results are sometimes obtained. The common deficiency symptoms include mental depression, irritability, poor mental concentration, uncertain memory and apprehension. Other complaints are headache, sleeplessness, anorexia, gastro-intestinal hypotonia, constipation, indefinite pains, paræsthesia, etc. In these cases a quick and sometimes a marked improvement in the general health of the patient occurs as a result of vitamin  $B_{\scriptscriptstyle 1}$ 

There are many cases of diabetes who complain of anorexia instead of hunger, which is known to be a common symptom of diabetes. A hypotonic condition of the gastrointestinal tract is present in these cases who are also constipated. In this group the author thinks vitamin B₁ therapy is specially indicated.

It should also be noted that there is a consensus of opinion among experimental workers that some relationship exists between thiamin intake and the amount of carbohydrate in the food, i.e. the larger the carbohydrate intake, the greater the demand for vitamin B₁.

Consequently, in our present-day conception of treating diabetes with high carbohydrate diet, it is logical to supplement these cases with vitamin  $B_1$ .

The rôle of vitamin  $B_1$  in carbohydrate metabolism.—The rôle played by vitamin  $B_1$  (thiamin) and the vitamin B complex and the part they play in the intermediary metabolism of carbohydrate has been a subject of controversy for a long time. Some authorities believe that the diabetic patient needs more of vitamin  $B_1$  than of the vitamin B complex. The author is inclined to agree with the above view but is definitely of opinion that the part played by vitamin B complex in effecting improvement in the carbohydrate metabolism in diabetes is certainly not inconsiderable.

In clinical trials of vitamin B₁ (thiamin) in cases of diabetes the author, during the past few years, has found that administration of thiamin, either parenterally or orally, effects some improvement in the carbohydrate tolerance of the diabetic patient and has further observed an apparent economy of insulin in several instances after its administration.

Mode of action of thiamin in carbohydrate metabolism.—It has definitely been shown that in thiamin deficiency the carbohydrate tolerance is definitely lowered. Deficiency in thiamin is believed to interfere with the normal metabolic interplay between glycogen, lactic acid and pyruvic acid.

The precise chemical process in which thiamin participates in the intermediary carbohydrate metabolism and in the biological oxidative reactions is however complicated and not clearly understood and the present paper, being more or less of a clinical nature, does not appear to be a suitable one for its detailed discussions.

One function of thiamin, however, appears to be clear and that is that thiamin in its biologically active form, viz, thiamin pyrophosphate, acts as a co-enzyme which in combination with a specific protein acts as a catalyst in the removal of pyruvic acid derived from lactic acid in carbohydrate metabolism. Hence in thiamin deficiency, the carbohydrate metabolism stops with the formation of pyruvic acid, which thus accumulates in the blood and the tissue. When thiamin is given in these cases this is remedied and abnormal metabolism of the tissues is brought to normal,

Result of parenteral administration of thiamin in diabetes.—Cases presenting vague or definite symptoms of thiamin deficiency (as mentioned before) were usually selected for this trial, and 25 such cases were treated with oral administration of vitamin B₁. Glucose tolerance tests were done on all these cases and an idea of their tolerance obtained before they were put on trial.

The patients were then put on a fixed diet scale, the carbohydrate value of which (in grammes) was determined and noted. The glucose excretion in urine (in grammes) was also calculated daily in 24 hours' collection of urine and was noted from day to day. The fasting level of blood sugar was determined about every 4th day and the results noted. When in this way the fasting level of blood sugar and the daily excretion of sugar reached the lowest limit and remained constant on the diet prescribed, the patient was put on injections of pure crystalline vitamin B, in doses of 50 mg. intramuscularly daily, keeping the diet constant as before. The urinary excretion of glucose and the fasting level of blood sugar were noted as before. The type of the results obtained is given in table I.

TABLE I

Effect of parenteral injections of thiamin in cases of diabetes. Patient M. C., 38 years.

Duration of diabetes—2 years; complication—neuritis of the arms

Date	Carbo- hydrate value of the diet (in gm.)	Total glucose excretion in 24 hours (in gm.)	Blood sugar mg. per 100 c.c.			
2-9-48	156	72	000			
4-9-48			286			
	156	68				
6-9-48	156	66	206			
8-9-48	156	56				
10-9-48	156	58	198			
	The patie	The patient was put of				
	thiamin	chloride int	ramuscularly			
	1	daily.	•			
12-9-48	156	42	1			
14-9-48	156	36	156			
16-9-48	156	12	100			
18-9-48	156	5	130			
20-9-48	156	nıl	108			
		of thiamin d	iggonting al			
22-9-48	156	s or anamm o	nscontinued.			
24-9-48		1	100			
30-9-48	156	nil	106			
00 0 30		nil	105			
	) r	'atient discharg	gea.			
	•					

Analysis of the results obtained.—The results of investigation on the above cases of diabetes, treated with injections of thiamin chloride in doses of 50 mg. daily, may be summarized as follows:—

(a) In 12 out of 25 cases (i.e. 48 per cent) a complete control of the diabetic condition could be obtained within a period of 10 days to a fortnight after the administration of vitamin B₁. The patient became sugar-free and the blood sugar remained normal even after the injections were discontinued.

- (b) In 5 cases (20 per cent) the injections had to be continued for a longer period (20 to 25 days) before the patient could be brought under control.
- (c) In 2 cases the urine could not be made absolutely free from sugar and the fasting level of blood sugar did not come down absolutely to the normal level even though the injections were continued for a period of one month. It must be noted, however, that the general condition of the patient improved considerably.
- (d) In the remaining 3 cases no improvement was noted.
- (e) In most cases of (a) and (b) groups the improvement of the diabetic condition was found to be maintained for even a fortnight to three weeks, after the thiamin injections were discontinued. No further observations could be made after that as the patient left the hospital.

Results of oral administration of thiamin in diabetes.—Selection of these cases for trial was made on similar lines as described before and all the procedures adopted were exactly the same except that 12 cases were put on trial and these were put on a oral daily dose of 30 mg. of vitamin B, divided into 10 mg. thrice daily. The periods of trial of these cases were found to be much longer.

The type of the results obtained is given in table II.

TABLE II

Effect of oral administration of thiamin in cases of diabetes. Patient S. H., 45 years.

Duration of diabetes—8 months; no complications present

Date	Carbo- hydrate value of the diet (in gm.)	Total glucose excretion in 24 hours (in gm.)	Blood sugar mg. per 100 c.c.
4-10-48	170	75	302
6-10-48	170	70	
8-10-48	170	66	280
10-10-48	170	60	
12-10-48	170	61	282
	The patien in doses of	t was put or 10 mg. thrice	vitamin B,
14-10-48	170	55	uany orany.
16-10-48	170	50	250
18-10-48	170	46	200
20-10-48	170	40	210
22-10-48	170	35	220
24-10-48	170	29	160
26-10-48	170	20	
28-10-48	170	12	125
30-10-48	170	Traces	
1-11-48	170	nil	115
3-11-48	170	nil	100
5-11-48	Vitar	nin B. discon	tinued.
7-11-48	170	nil	••
11-20	170	nil	108

Analysis of the results obtained.—The results of investigation of 12 cases of diabetes treated

with oral daily dose of 30 mg. of vitamin B₁ may be summarized as follows:—

the diabetic condition could be controlled for a period of 21 to 30 days after the oral administration of 10 mg. of vitamin B₁ thrice daily.

(b) In 5 cases (about 42 per cent) the administration of thiamin had to be continued much longer (a maximum period of six weeks) to bring the diabetic condition under control.

(c) In 2 cases no improvement was noted.

(d) The improvement of the diabetic condition in (a) and (b) groups was found to be maintained even after the administration of thiamin was discontinued.

. Comment.—It is to be noted that the published observations upon the effect of vitamin B, on human diabetes do not show a uniformity of results. Some of the publications appear to be made on scanty or insufficicontrolled observations. The present paper is based on systematic observations on 37 cases of diabetes and the results obtained lead to the conclusion that in most cases of diabetes showing vague or definite signs and symptoms of vitamin B, deficiency, marked improvement in the carbohydrate tolerance of the patient as well as improvement of general health was obtained. In some of these cases complicated with neuritis there was a definite relief of pain but the amelioration of the associated symptoms such as weakness, paræsthesia and loss of appetite was even more-marked. Apart from the control of diabetes in most of these cases there was in almost every one of them a feeling of well-being.

No claim is however made on the 'cure' of these cases but it may be noted that in a few of them, who appeared again from time to time, the improvement was found to have been maintained. Incidentally, it may be mentioned that the author has also observed that in some cases of diabetes having insulin treatment considerable reduction in the dose of insulin could be made if vitamin B₁ was simultaneously administered.

# ALLERGY AND DESENSITIZATION

CURE OF BRONCHIAL ASTHMA WITH:

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Sensitiveness on the part of individuals to pollen, dandruff and other agents of a protein nature is known to cause an allergic syndrome,

commonly exemplified by a rash or asthmatic attacks. The allergic syndrome may vary from a simple nasal catarrh to acute attacks of breathlessness, fever, asthma and in some cases a generalized rash (urticaria). The well-known remedies range from the administration of calcium salts to the injection of adrenalin hydrochloride, but a permanent cure is often difficult, and the treatment consists rather in prevention and alleviation of suffering than a permanent cure:

The authors wish to place on record a case of bronchial asthma, responding miraculously to a course of mixed bacterial vaccine, when all other available treatment had failed. The patient was a local employee, male, of this Institute, about 36 years of age. He had an attack of acute bronchitis some ten years back of which he was cured. Since then he had attacks of bronchial asthma recurring every autumn, and lasting throughout the winter, and disappearing with the advent of the summer. Symptoms consisted of breathlessness (this increased during the night), cough and a hoarseness of the voice. Expectorant consisted of long strands of solidified fibrin and mucus. The patient revealed that he had tried various kinds of indigenous drugs, proprietary preparations, e.g. ephazone, dodo, etc., without any lasting effects. He was examined as an out-patient in November 1947. The patient had no relief from sulpha drugs, nor from penicillin. injections did not prove useful. He looked anæmic, pale and jaundiced, and had lost nearly 30 lb. of weight. On enquiry it was found that he had developed a peculiar sensitiveness towards vegetables, e.g. cabbage, cauliflower, spinach, etc., but not to meat or eggs. He had no temperature, and the urine was normal. Next step taken was the bacteriological examination of sputa. Bacteriological examination revealed the presence of B. hæmolytic streptococci (Lancefields group A), Staphylococcus pyogenes aureus ( $\beta$  toxin group), and B. coli atypical. A vaccine was prepared consisting of

The details of the course of injections followed in this case are set out below:— Number of injections Total number of 19

Dose ·

injections administered as follows:—

0.1 cc., 0.2 cc.; 0.3 cc., 0.4 cc., 0.5 cc., 0.75 cc., 1.0 cc., 1.0 cc. and further ten injections of 1.0 cc. each. The injections were given every fifth day.

No acid-fast rods were seen on repeated examinations of the sputal sputal

^{*} Many more cases were also investigated but the data collected were incomplete because some of the patients left the hospital before the investigations were complete. The two tables given above indicate the type of results obtained in most cases in each group. All the results have not been given in order to minimize space in compliance with the wishes of the Editor.

"The patient experienced no discomfort except a slight rise of temperature after the first injection. The local reaction was a slight redness and pain. He exhibited a feeling of well-being and confidence after the second vinjection. He, reported that he was very much better. After the third injection the harassing symptoms of breathlessness and cough disappeared and the patient was relieved completely of the attacks after a fortnight. There was a general improvement in the condition of the man. It may be added that Mukteswar is a hill station in the Kumaun Hills, situated at 7,700 feet above sea level. Winters are severe with heavy snowfall. The patient remained here in the winter of 1947 without any ill effects. He now takes part in the outdoor activities from which he was debarred for the last ten years. He has gained his normal weight and is in perfect health.

# Discussion

It is difficult to say whether this case had its origin in some bacterial infection or some common allergens, e.g. pollen, dandruff, etc. The patient had been an animal attendant, looking after a group of experimental animals at this Institute. It seems possible that, under such conditions, dandruff and other agents along with a large number of streptococci, staphylococci, B. coli or other organisms may get into the system causing thereby bronchitis and asthma. The disease had a seasonal occurrence, starting in the autumn when pine dust and myriads of pollen grain float about freely in the air, and in the winter the malady became aggravated. The superiority of the bacterial antigen in this case over non-specific protein therapy of milk injections is not understood but the introduction of specific bacterial allergens may be worth trying in the treatment of such cases of bronchial asthma where other treatments have failed.

116 11 111 , Summary ' A case history of bronchial asthma and its successful treatment with mixed bacterial vaccine is described.

The authors wish to acknowledge the kindness of Dr. S. Datta, Dsc, MRCVS, D.TVM., TRS. (Edin), FNI., Director, Indian Veterinary Research Institute, Mukteswar-Kumaum, UP, in allowing them to record this case. 1140

# SOME ASPECTS OF AMŒBIASIS IN MADRAS 15

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By D. GOVINDA REDDY, M.D. Professor of Pathology, Medical College, Madras M. THANGAVELU, MD.

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THE idea existed until recently that Entamoba Justolytica infection was more prevalent in the tropical and sub-tropical areas than in temperate

and cool regions; but now we know that even in the tropics, bacillary dysentery is more common than amedic dysentery. Acton and Knowles (1924) state that bacillary dysentery is at least five or six times as common among the civil population of Bengal as amobic dysentery. Fletcher and Jepps (1927) found that in 983 cases of dysentery in Kuala Lumpur no less than 77 per cent were of the bacillary type. Experience in the second world war has also confirmed the finding that bacillary dysentery is more frequent than amobic infection. Payne (1945) analysed 2,000 cases of dysenteries observed in India both in the forward areas and the base hospitals and has, on the other hand, come to the conclusion that amediasis was as common as bacillary dysentery.

Our analysis of 2,641 cases treated in the General Hospital, Madras, both as in-patients as well as out-patients during the period of five years 1941 to 1946 is to be found in table I.

TABLE I Analysis of dysenteric disorders treated in the Government General Hospital, Madras, for five years with mortality rate

Dysentery	Total number of cases	Percent- age of incidence	Number of deaths	Percent- age of deaths
Amœbic	1,011 ·	38.3	62	6.13' !
Bacillary	1,345 ·	50.9	134	99' !
Mixed (	28	1.1	1 1	3.8'' !
Non-specific	257 ·	9.7	1 37	14 4;' į

Age and sex distribution.—This is shown in table II.

In children the incidence of infection is low. Still amæbiasis is by no means unknown even in infants. Moore (1881) and Biggam (1932) reported amobic abscess in children. Higher rates of infection have been reported by Willets (1914) in Philippino children. In an analytical study of 796 cases of E. histolytica infection, Chaudhuri and Rai Chaudhuri (1946) found that 2.5 per cent of infections were in children below 15, years. In Gharpure and Saldanha's (1931) series the incidence of infection in children below 10 years was only 1 per cent. In our study of 1,011 cases, nearly 8 per cent of the patients were in the age group of 0 to 10 years. Again, there is a decline in the incidence of infection after 50th year. The smaller incidence in young children is not due to immunity, but to ac-lower risk of exposure to infection; while, the decline in the number of infections after middle life indicates a possible immunity developing as a result of previous infection.

All are agreed that males are more frequently infected than females and our figures are also in agreement with theirs (table II). The lower incidence of infection among the females is not of much significance, as it is definitely, not due to inherent insusceptibility; but perhaps to more

restricted opportunities of contact with infected cases.

Table II

Age and sex incidence of dysenteric disorders treated in the Government General Hospital,

Madras, for five years

Age	Amœbic	Bacillary	Mixed	Non- specific
0-10 11-20 21-30 31-40 41-50 51-60 61-70 71 and above	82 104 301 253 172 72 21 6	224 178 427 254 154 68 26	3 1 12 5 5 2 0	80 27 52 40 38 15 3
TOTAL	1,011	1,345	28	257

,	Амсевіс		BACILLARY		Non- specific	
Year -	Males	Females	Males	Females	Males	Females
1941 1942 1944 1945	116 149 209 174 188	27 37 26 50 35	312 222 205 120 149	102 38 69 57 71	24 16 63 39 37	9 20 23 14 12
Total	836	175	1,008	337	179	78
Percentage	82.7	17.3	74.9	25.1	69.7	30.3

Seasonal incidence.—Amæbiasis in general does not exhibit that seasonal incidence which is characteristic of bacillary dysentery. summer months a profusion of flies may increase the risk of infection by fæcal contamination. In the rainy season greater chances are afforded for the dispersion of *E. histolytica* cysts in water. Analysis of 1,011 cases treated in the General Hospital, Madras, during the five years 1946, revealed a higher ending December incidence in the monsoon months, August to December (table III). This is in agreement with the findings of Tribedi and De (1938) who, in a study of the disease in Calcutta from 1929 to 1937, found that though the incidence among Europeans did not always follow the periods of highest rainfall, the number of cases among the Indian population showed a more definite seasonal correlation.

Distribution of ulcers.—Of the 44 cases of post-mortem examinations conducted during the period of five years, intestinal lesions were present in 38 and only hepatic lesions were seen

in the remaining 6. The distribution of the ulcers is presented in table IV.

TABLE III

Seasonal incidence of dysenteric disorders treated in the Government General Hospital, Madras, for five years

Month	 Amœbic	Bacillary	Mixed	Non- specific
January February March April May June July August September October November December	92 64 45 70 79 77 82 111 87 110 86 108	150 92 75 84 74 94 139 115 117 104 130 171	3 3 2 2 2 1 1 4 1 4 2	30 17 13 16 17 26 17 26 24 19 30 22
TOTAL	 1,011	1,345	28	257

# TABLE IV

<del></del>			
Entire colon Cæcum Ascending colon Transverse colon Splenic flexure Sigmoid Rectum		••	27 4 3 1 1 1
	Torus		38

Though in the majority of cases the primary lesion starts in the cæcal area, with the progress of the disease, the entire colon seems to get involved. The findings published by Clark (1925) in an analysis of amebic dysentery are: 61 per cent throughout bowel, 34 per cent isolated areas and 5 per cent only scars.

According to many authors, appendicular lesions are said to be fairly common and whereever cæcum was extensively involved, the appendix was found to show amæbic lesions. Our autopsy findings are not in agreement with the above statement and only twice have we seen amæbic involvement of the appendix (figure 1, plate XXXIV). What has struck us most is the frequency with which the rectal area is involved. In many cases the infection has extended down to the ano-rectal junction. During the experimental investigation on the pathology of amæbiasis in cats and dogs, Wagner (1935) found the rectum immediately above the anal ring and the region just below the ileo-cæcal valve particularly vulnerable to amæbic infection and strangely enough the incidence is more frequent in the same regions in human beings also.

Amæbic granuloma (amæboma).-An uncomplicated intestinal amedic lesion is a noninflammatory, necrotic ulcer. On rare occasions, the amobic lesion seems to form a localized tumour, producing sub-occlusion, a condition simulating tuberculosis, actinomycosis or a neoplasm. The chief factors responsible for the production of a granulomatous mass appear to be inflammation and ordema due to infection with secondary organisms. In the sections we have studied, these changes were prominent in the submucous and muscular coats. The irregular peristalsis initiated by the amebic granuloma often results in acute intussusception. A complete review of this condition with a report on six cases was published by Reddy and Rangam (1946). The paucity of reports in early literature was to a great extent due to ignorance of this condition. Surgery in the tropics was not as popular as it is to-day and when a surgeon resected a mass, opportunities for histological examination by a competent pathologist were meagre. Here a brief comment on the advisability of operative interference in cases of intestinal obstruction due to amobic granuloma may not be out of Where intussusception has occurred causing complete obstruction and relief thereof is urgent but not feasible with medical treatment, resection of the gut is necessary. This should always be followed by a full course of emetine treatment, since there will always be amæbic lesions in the rest of the colon. Still surgical resection is not favoured by some surgeons, because they have the apprehension that the sutures will not take well in intestinal amœbiasis as the gut is friable. The experience in the General Hospital fortunately has been very encouraging, since in a large percentage of operated cases, the post-operative period was

uneventful and recovery complete.

Amæbic dysentery in association with other diseases.—Co-existence of amæbiasis and carcinoma of the rectum has been recorded in several cases. More often it is the amæbic granuloma that is mistaken for a neoplasm. It is very doubtful if ever a carcinoma develops at the site of the amæbic ulcer, however chronic it

may be. The high incidence of chronic amæbic ulcers with relatively low percentage of the malignant conditions of the colon in this country bears testimony to this. On more than one occasion, anothic dysentery has been noticed in typhoid patients in the Government General Hospital, Madras. Traces of blood seen in the motion suggest hemorrhage; a much dreaded complication in typhoid. Unless the motion is examined microscopically, one easily misses the true nature of the lesion. In the first case under our care, rigid diet regimen with raising of the foot end of the bed was strictly adhered to. Since the condition of the patient continued to be good in spite of bleeding with no rise in the pulse rate, we were forced to bestow greater attention on the examination of motion and, to our surprise, active amobe were found in the faces. With small doses of emetine, the dysentery was easily controlled and cured.

# Secondary amæbiasis

Amarbic hepatitis and hepatic abscess.— During the period of five years from 1941 to 1946, 1,534 cases of hepatitis were treated in the Government Hospital, Madras (table V).

Table V

Cases of amorbic hepatitis treated in the medical wards of the Government General Hospital,

Madras, for five years

Year	·.	Cases of hepatitis with or without jaundice	Amœbic hepatitis including abscess
		~ ~~~	ديند عمليات سمد
1941	٠.	207	81
1912		171	54
1914		272	· 71
1945		235	70
1946	• •	285	85
	-	200-00-	
Тоты		1,170	364
			_

Of these, 364 (30 per cent) were diagnosed as of amorbic origin. The age, race and sex distribution is shown in table VI. During the

Table VI
Age, race and sex distribution of amæbic hepatitis

Age	Incidence	Percentage	Race		<del></del>	Males	Females	Total
0-10 11-20 21-30 31-40 41-50 51-60 61-70	6 20 106 139 64 24	1.6 5.4 29.2 38.3 17.6 6.4 1.2	Hindus Muslims Indian Christians Europeans Anglo-Indians	•••	•••	274 12 30 4 6	25 4 4  5	200 16 34 4 11
71-80	1 ,	- 0.3		Total,		326	38	. 364 :
	·		frema los	••		326 38	\$9.6%	

same period 124 cases of liver abscesses were attended to in the surgical wards of the General Hospital and 40 cases in King George Hospital, Vizagapatam (table VII).

### TABLE VII ·

Age and sex incidence of amæbic liver abscesses treated in the surgical wards of the Government General Hospital, Madras, and King George Hospital, Vizagapatam

Age	Government General Hospital, '' Madras	King George Hospital, Vizagapatam	Total
1-10 11-20 21-30 31-40 41-50 51-60 61-70 71-80	20 21 21 21 31 70 4 .3	1 2 13 16 4 3 0	2 4 34 37 35 7 3 2
TOTAL	84	40	124

 Males
 ...
 122

 Females
 ...
 2

Age.—In our series the largest number of cases are in the age group of 20 to 50 years, and this is in agreement with many published reports. In Rogers' (1921) series of 453 cases, over 70 per cent were in the age group of 20 to 40. In 169 cases of liver abscesses recorded by Gharpure and Saldanha (1931), 76.8 per cent occurred in the age period of 20 to 40. Liver abscess is a disease mainly of early adult life. In children the incidence of infection is low. Amœbiasis, however, is by no means unknown in children and even in the infants, and in our series 4 instances were in children below five years. Niblock (1911) from Madras reported a case of liver abscess in an infant 11 months Recovery followed the removal of 18 oz. of pus from the abscess. He recorded also that three other children in the same family died of the same complaint. The youngest patient on record is a 3 months old child reported by Biggam (1932). The infant suffered from amœbic dysentery and necropsy revealed a small abscess in the right lobe of the liver.

Race.—The records left by the earlier European physicians show that the liability of the European to liver abscess was nearly 35 times that of the Indian. Rogers (1921) found the incidence of liver abscess in Hindus to be 5 times that in Muslims. In our analysis the incidence among Hindus is about 20 times that in Muslims, whereas the Hindu population is only 10 times that of the Muslims. The relative freedom of the Muslims may, to a certain extent, be attributed to the lesser use of alcoholic drinks.

Sex.—Males are much more commonly affected than the females. In Rogers' series of 453 cases composed of 361 Indians and 92 Europeans, there were only 8 females among the former and 4 among the latter. In Gharpure and Saldanha's (1931) 169 cases in Indians, there were 164 males and 5 females and in Chatterji's (1927) collection of 225 cases, there were only 2 females. In our series treated in the medical wards, 326 were males and 38 females (10 per cent), whereas in the surgical wards, only 2 cases of liver abscess in women were recorded out of a total of 124 cases. We have no satisfactory explanation to account for the low incidence in the females. Of the very many explanations that have been offered, one is that the menstruation by preventing hepatic congestion may make the organ less liable to abscess formation. The second reason may be the abstemious character in women. Recently, one woman was admitted into the General Hospital for amæbic abscess of the liver and on close interrogation she confessed that she was given to the habit of drinking alcohol. Sandwith aptly remarked 'I have noted on the very rare occasion when a European woman had suffered from liver abscess, she has been endowed with a masculine thirst !'

# Pathogenesis

Infection with E. histolytica does not necessarily lead to abscess formation in the liver. In the great majority of cases the amœbæ.do not colonize in the liver parenchyma but soon die due to some unknown amæbostatic action. Whether or not amæbic infection will lead to hepatic suppuration is determined to a very great extent by the action of one or more of the predisposing causes which lead to impairment of the functional capacity of the liver or alter its structural integrity by the action of toxins. The consumption of alcohol is considered a potent predisposing cause in the etiology of this condition. In an analysis of 170 cases by Megaw (1905), habitual use of alcohol was noticed in 70 per cent of the cases. In a series of 55 cases among the Europeans, Rogers found that all of them used alcohol and in 16 per cent the amount consumed was excessive. Rarity of liver abscess in the females at least some years ago might have been due to a great extent to non-consumption of alcoholic drinks. While all agree that liver abscess is less frequent among teetotallers, in our opinion, alcoholic consumption as an ætiological factor is over-exaggerated. The relation of alcohol to the production of liver abscess appears to be similar to that which it bears to the production of the cirrhosis of the liver. Experimental work on animals in recent years has shown dietary deficiency chiefly proteins, and lipotropic factors lead to fatty infiltration, necrosis of the liver cells and cirrhosis. There may be enough justification, therefore, to presume that a similar

change in the liver may be responsible for the colonization and thriving of the amœbæ.

# Frequency of liver abscess associated with amæbic dysentery

Most of the statistics that are available show the incidence of liver abscess in fatal cases of dysentery; hence this cannot be a correct indication of true frequency clinically. In all likelihood the incidence is bound to be considerably less.

# Frequency of dysenteric ulceration in fatal cases of liver abscess

In 500 cases of hepatic abscess of the liver reported by Kartulis (1889), there was associated dysenteric lesion in 60 per cent. In 66 cases of liver abscess recorded by Rogers, intestinal lesions were seen in 77 per cent. In our autopsy study of 15 cases of liver abscess, 9 (60 per cent) showed varying amounts of intestinal ulceration. There are several records in the literature of the occurrence of amæbic liver abscess in patients who had never suffered from dysentery or diarrhœa. Craig (1934) reported 7 cases of amœbic abscess of the liver in individuals who had never suffered from dysentery. Rogers (Rogers and Megaw, 1930) states in 20 per cent of autopsy cases of liver abscess, there was no history of dysentery, although some ulceration of the intestine was present. In our own series, in 6 out of 15 cases, there was no evidence of recent intestinal lesion.

### Nature of liver abscess

Amœbic abscess is mostly solitary, but multiple abscesses are not so rare as we are made to believe and probably constitute 30 per cent of all cases.

Author	Year	Total	Single, per cent	Multiple, per cent
Rogers (India)	1913	66	70	30
Craig	1935	39	60	40
Huard and Meyer	1936	115	91	9
Reddy (Madras)	1946	15	80	20

# Distribution of the liver abscess

Most of the abscesses are localized to the right lobe, chiefly at the summit of the liver. In Rogers' (1913) series, 88 per cent occurred in the right lobe and 12 per cent in the left. Clark (1925) found 60 per cent in the right lobe and 40 per cent in the left. In 9 fatal cases published by Craig, 5 abscesses were in the right lobe, 3 in the left and 1 in the spigelii. In our series of 15 cases, 3 were in the left lobe. This distribution is based on the anatomical division of the liver by the falciform ligament, which is only arbitrary and differs from embryological and pathological division according to which a

part of the right anatomical lobe belongs to the left lobe. If based on this division, many abscesses now located in the right lobe should be deemed to occur in the left lobe.

### Histopathology

In the sections we have studied, amæbæ were found almost constantly in the wall of an acute abscess, but on the condition becoming chronic, we have found it difficult to demonstrate them. Fibroblastic proliferation and fibrosis were prominent in the wall of a chronic abscess. Just outside the wall, where there is liver cell regeneration, we have come across some hyperplastic liver cells with giant nuclei presenting a picture liable to be mistaken for malignant change.

### Symptomatology

Apart from the well-known symptoms associated with liver abscess, jaundice may be met with on rare occasions. From a survey of available literature, latent jaundice appears to-be not uncommon in amæbic hepatitis and abscess of the liver, but deep jaundice of an obstructive type is a very rare accompaniment. Reference to this condition is absent or meagre in textbooks on pathology and in most of the commonly used textbooks on tropical diseases. Because of the rarity of case reports of jaundice in liver abscess, there seems to be an impression, that the presence of deep jaundice negatives the diagnosis of amobic liver abscess. From this institution, Reddy and Rangam (1945) have published two cases of jaundice in amobic liver abscess. Subsequently, we had occasion to conduct another post mortem where an encysted liver abscess in the wall of which, a main bile duct was caught, was responsible for an obstructive jaundice and an obstructive biliary cirrhosis. In our study, we have not come across a single case report of this nature; and hence a short summary of this case may be of interest.

Case.—A Hindu male, aged 50 years, was admitted in the medical wards of the Madras General Hospital for general anasarca, ascites and jaundice. His condition grew worse and he died. Necropsy revealed (1) fibrocaseous tuberculosis of the lungs, (2) amedic ulceration of the large intestine, (3) two chronic abscesses in the liver, one 3 inches in diameter and another 1 inch, and (4) monolobular cirrhosis of the liver with bile staining (figure 2, plate XXXIV).

# Progress of liver abscess ""

Spontaneous healing of the abscess by encystment may occur or the pus may be absorbed and the cavity obliterated, leaving a puckered cicatrix. Such favourable results are not very common and an encysted mass when seen in the post-mortem room may be mistaken for a solitary gumma. In our autopsy work we have seen two such cases. In the absence of treatment, the abscess may reach an enormous size

and eventually rupture into the adjacent tissues or more commonly into some neighbouring cavity or viscus. The site of rupture is to a great extent determined by the original site of the abscess and the direction in which it tends to spread. Since a large percentage of abscesses are situated on the upper surface of the right lobe, rupture most commonly occurs into some viscus aboye the diaphragm, lung or pleural space. In the case of abscess situated on the under surface, rupture may occur into the stomach or intestine. In Craig's series of 190 cases, rupture into the pleura occurred 117 times and into the peritoneum on 39 occasions. Rupture into the stomach and intestines was rare and occurred only on 9 occasions. In our series of 9 cases of rupture, 5 were into the peritoneum, 2 into the lung, 1 into the pericardium and 1 into the rectus sheath. Rupture into the pericardium is very rare and occurs in abscess of the left lobe. Clinical diagnosis is often mistaken for tuberculous pericarditis or some other pericardial effusion. A short clinical history of a case that has come under our observation may not be out of place.

**Case.—A Hindu male, aged 35 years, was admitted into the medical wards for pain in the right hypochondrium and right half of the epigastrium of 4 weeks' duration. Liver was palpable and extremely tender. F.T.M. and barium meal results were normal. Total W.B.C. 6,100. Post-mortem examination revealed (1) bilateral pleural transudate, (2) amedic abscess of the liver of the size of a tennis ball involving the left lobe and left half of the right lobe communicating with the pericardium (figure 3, plate XXXIV), (3) enormously distended pericardium containing purulent exudate, and (4) healed pigmented sears of the large intestines.

A very rare instance of spread of amebic abscess which we have noticed was one in which the abscess contents gained entrance into the rectus sheath (figure 4, plate XXXIV) and presented a picture of abscess of the abdominal wall.

Case.—A male, aged 35 years, was admitted for a painful swelling of the abdominal wall of 4 months' duration. He gave a history of dysentery 4 months prior to admission. The clinical findings were: (1) Swelling in the right umbilical and lumbar regions extending to the right hypochondrium, (2) barium enema hepatic flexure pushed downwards, and (3) total W.B.C. 6,800. Under local anæsthesia, a small incision was made on the right flank and abscess drained. The abscess was found communicating with a liver abscess. Post-mortem examination revealed a large orange-sized abscess on the under surface of the right lobe communicating with an encysted abscess of the abdominal wall-right rectus sheath. The abscess -travelled down to the iliac crest. contents had The peritoneal cavity was free from infection.

# Pulmonary amæbiasis

It is commonly mentioned in the textbooks that in the expectorated material, amobe, liver cells and Charcot-Leyden crystals may be found. Chaudhuri and Rai Chaudhuri (1946) reported two cases in which "amœbæ were seen in the sputum. We have not seen amobie in the expectorated pus though we have examined the expectorated fresh material on more than one occasion. Since live amorbo are to be seen in the abscess wall but not in the necrotic material, it is very doubtful whether examination of the coughed out material will ever yield positive results. A note of caution is very essential here. especially to the beginners in the art of microscopy that phagocytic cells which are abundant in the alveolar contents of the lung may be easily mistaken for amœbæ,"

# Amæbic abscess of the brain

Though frequently mentioned in the textbooks, amæbic abscess of the brain is a rare complication of amobiasis and is usually secondary to abscess of the liver or lung. Absolute proof that the brain abscess is of amæbie origin is very often wanting, since the demonstration of amœbæ in the cerebral tissue has not met with any success. The mechanism by which the E. histolytica reaches the brain is not yet understood. The contents of the brain abscess resemble those of the liver abscess being reddish in colour. With softening a cavity is formed. The situation of the abscess is almost invariably in the cerebrum. The disease advances rapidly and death occurs from 6th to 8th day with deep coma. Cases have been recorded in which the onset has been sudden with signs of jacksonian epilepsy. In our post-mortem work, we have not met with even a single case, but the senior writer had occasion to witness a post mortem in the department of pathology in the University Medical College, Mysore. We are indebted to Professor V. R. Naidu, professor of pathology in that institution, for the following case history:

Case.—A Hindu male, aged 45, was admitted into the Mysore Medical College Hospital on 26th April, 1944, in a semi-conscious condition and died on 28th April, 1944. The clinical findings were: (1) Right-sided hemiplegia with aphasia, (2) exaggerated jerks on the right side with ankle clonus, (3) plantar reflexupgoing toe on the right side, (4) muscular tone—spasticity on right side, and (5) laboratory findings—Blood: no malarial parasites, microfilaria positive. Motion: nil abnormal.

^{*}In one (not two) of the cases reported by Chaudhuri and Rai Chaudhuri E. histolytica trophozojtes were found in the sputum on four consecutive days, and this was confirmed each time by the Department of Protozoology of the School of Tropical Medicine, Calcuta. Such a finding, though rate, has also been reported by J. R. Mencia (Avance Med., 5, 35. Abstrat: Internat. Med. Digest, 45, 213) who found numerous E. histolytica in the sputum.—Entrop. I.M.G.

# PLATE XXXIII

CONGENITAL PERFORATION OF THE AORTIC SINUSES OF VALSALVA : M. A. HAMEED. (O. A.) PAGE 552

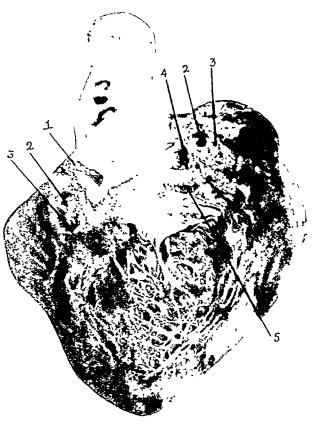


Fig 1-Case 1

- 1 Opening in the right acitic sinus.
- 2 Inter-communicating foramina between the two aneurysms.
- 3. Aneurysmal cavity (right).
- 4. Opening in the left posterior sinus
- 5 Opening below the left posterior acritic cusp into the left ventricle.

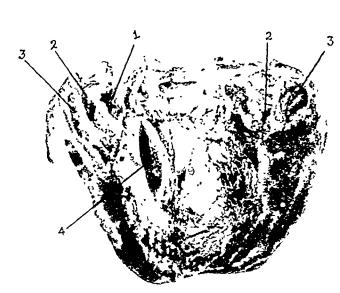


Fig. 2.-Case 2.

- 1, 2, 3. Three ancurysmal cavities in the upper part of the interventricular septum—inter-communicating with one another.
  - 4. Anculysmal cavity in the lower part of the interventificular septum. The cavity has been slit and was filled with blood clot.

# PLATE XXXV

# SOME ASPECTS OF AMŒBIASIS IN MADRAS : D. GOVINDA REDDY & M. THANGAVELU. (O. A.) PAGE 557

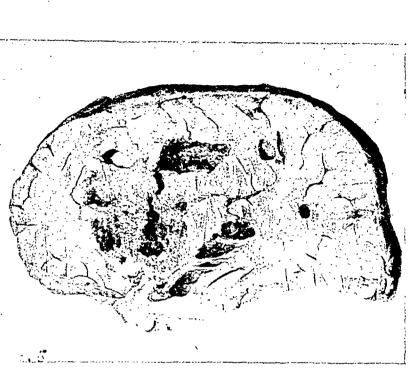


Fig. 5.—Amæbic abscess of the brain in the cerebrum on the left side.

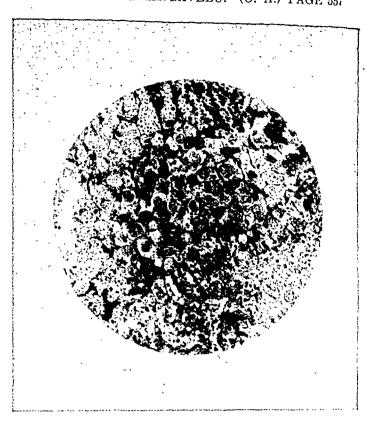


Fig. 6.—Photomicrograph. Cutaneous amæbiasis; large collection of amæbæ in the perianal subcutaneous tissue.

# A CASE OF KALA-AZAR WITH ENORMOUS LEUCOCYTOSIS : D. C. MAJUMDAR, D. RAY MAHASAYA & A. SEN GUPTA. (M. H. P.) PAGE 564

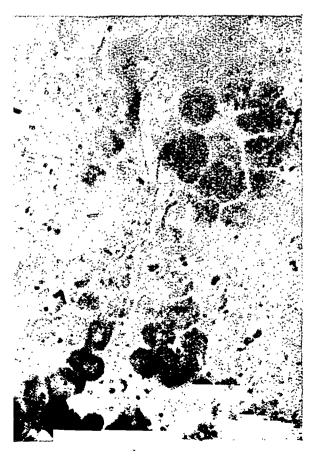


Fig. 1.

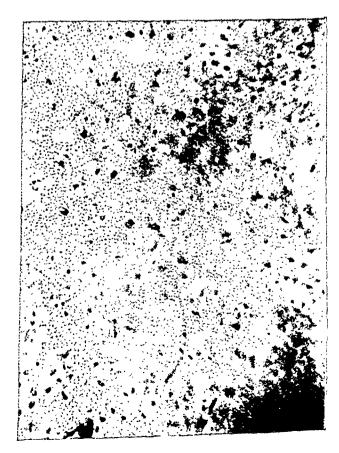


Fig. 2

Post-mortem findings .- Myocardium : flabby. Lungs: right pleural cavity contained 56 oz. thick reddish brown fluid. The base was firmly adherent to the diaphragm. Left pleural cavity contained 6 oz. of blood-stained fluid. Peritoneal eavity contained 3 oz. of blood-stained fluid. Liver enlarged; the dome of the right lobe was firmly adherent to the diaphragm. The upper half of the right lobe was soft and fluctuant. On section a large abscess communicating with the pleural cavity through a small perforation of the diaphragm was found. Intestines: no evidence of recent amæbic ulceration. Cranium: C.S.F. under increased tension. An area of localized leptomeningitis over the left temporal

Sagittal section of the left cerebral hemisphere revealed a large abseess cavity measuring about 6 cm. in diameter situated in the anterior twothirds of the cerebrum (figure 5, plate XXXV). It was pointing to the left temporal region. The wall of the abscess was ragged with creamy blood-tinged liquid contents. The white matter of the brain showed some amount of softening for an area of about 2 cm. around the abscess.

### Cutaneous amæbiasis .

Amediasis of the skin is not very common, but may be easily diagnosed if suspected. Areas of the skin usually affected are: (1) Peri-anal skin, (2) at the incision for operation of liver abscess, and (3) at the incision for appendicectomy. Rajam and Rangiah (1939) reported the first case of cutaneous amoebic ulceration around the anus from this institution. Mahadevan (1945) has later published two cases of cutaneous amediasis admitted into the King George Hospital, Vizagapatam. His first case was one of extensive ulceration of the abdominal wall consequent on the spontaneous rupture of a liver abscess to the parietes and his second was one of extensive ulceration of skin around the anus extending into both the gluteal regions. Professor Rajam's patient, since publication, has attended his department on and off for recurrence of perianal ulceration and stricture of the rectum. Repeated examinations of the biopsy material (figure 6, plate XXXV) and the fæces have shown persistence of amœbæ in spite of a course of emetine injections every time he attended the hospital. This shows that, unless the intestinal amediasis is completely cleared, the skin which has once given way to amorbic infection, though it shows signs of healing every time a course of emetine injections are given, continues to be vulnerable to amobic invasion.

#### Summary

A brief survey of amæbic lesions treated in the General Hospital, Madras, during a period of five years from 1941 to 1946 is presented. Necropsy records are given wherever possible. The subject is presented under the following

(1) Seasonal, age and sex distribuheadings: tion of intestinal lesions, (2) amobic granuloma (amedoma) of the intestines, (3) amedic dysentery associated with other diseases, (4) amæbic hepatitis and hepatic abscess, with age, race and sex distribution, (5) frequency of liver abscess associated with amobic dysentery, (6) distribution of the liver abscess, with rare sites into which it has ruptured, (7) jaundice in amobic liver abscess, (8) amobic abscess of the brain, and (9) cutaneous amobiasis.

We are indebted to the medical staff of the Government General Hospital, Madras, for permission to use the hospital records and to Dr. P. P. Chandu Nambiar for the statistics of liver abscess treated in the King George Hospital, Vizagapatam.

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# A Mirror of Hospital Practice

# A CASE OF KALA-AZAR WITH ENOR-MOUS LEUCOCYTOSIS

By D. C. MAJUMDAR, M.B., B.S., M.R.C.P.

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An underdeveloped Hindu male child, aged 3 years, was admitted into the hospital with fever, cough, abdominal distension and discomfort of three days' duration. The child had measles three weeks previously.

On admission the child was conscious, restless, slightly dyspnæic, anæmic and cyanosed. The forehead was covered with patches of thin greyish crusts; and brownish patches were noticed on the trunk and limbs. There was no enlargement of lymph glands, no discharge from the ears and no evidence of mastoiditis. The neck was soft and freely movable. Kernig's sign was negative. Lungs showed signs of patchy consolidation over the left upper and middle zones, and scattered râles were audible throughout elsewhere. very much distended abdomen was tympanitic but no free fluid could be detected. The spleen was not palpable. The liver was soft and enlarged four fingers below the costal margin. The bladder was distended. Heart sounds were normal but rapid.

Laboratory findings.—Blood: Hæmoglobin 7.25 gm. per 100 ml. Total erythrocytes 2,550,000 per c.mm. Total leucocytes 148,000 per c.mm. Neutrophiles 15 per cent (myelocytes 3 per cent), lymphocytes 85 per cent (large 4 per cent, small 81 per cent).

In 500 cell counts no eosinophiles, basophiles nor monocytes were found. A fair number of normoblasts were present. Leishman-Donovan bodies both extra- and intra-cellular (within neutrophile poly) were present in the peripheral blood smear (finger prick) (see photomicrographs, figures 1 and 2, plate XXXV). The low power one shows the leucocytosis, and the oil-immersion picture shows the L.-D. bodies.

Urine and Stool: Nothing of significance detected. A second examination of blood done a short time after yielded an almost identical result. Blood culture was not done. Sternal and liver puncture smears taken shortly after death showed presence of large number of L.-D. bodies.

Oxygen inhalation improved the cyanosis and very temporarily relieved the respiratory Pathology, for his kind co-operation.

distress. Enemata, flatus tube and carminatives relieved the distension of the abdomen but for a short while. The child survived for eighteen hours only after admission to the hospital. The abdominal distension, respiratory embarrassment and restlessness were persistently on the increase till death. No permission for autopsy could be obtained.

The presence of rare features in the clinical picture and laboratory findings involve a certain amount of confusion. Relevant investigations, to throw further light and clear the obscurities, could not be foreseen and undertaken because of the shortness of period under observation and the unexpected nature of the laboratory findings. Routine examination of thin peripheral blood smears do not usually reveal the presence of L.-D. bodies.

From the blood picture a double affection can be inferred: (1) Kala-azar, and (2) acute lymphatic leukæmia accounting for such tremendous lymphocytic upheaval. The magnitude of the leucocytes exceeds the usual range seen in inflammatory conditions, moreover the polymorphs are then the usually preponderant cells. The enormousness and erratic nature of rise of lymphocytes cannot be ascribed to such inflammatory condition, even allowing for the age of the patient. Absence of enlarged lymph glands, palpable spleen and any hæmorrhagic manifestation go against acute lymphatic leukæmia superimposed upon kala-azar. In lymphatic leukæmia, again, the increase is expected more in the large lymphocytes than in the small ones and lymphoblasts should also be present. Absence of enlargement of spleen and absence of increase in the myeloid group of cells go against splenomedullary leukæmia. The question arises whether the recent attack of measles played a part in the production of lymphocytosis. A leucocytic count of 100,000 per c.mm. with markedly preponderant lymphocytes is not uncommon in pertussis, another common ailment in children.

That kala-azar can cause enlargement of liver without the spleen being enlarged is known. This case appears to be one of rare types of acute fulminating kala-azar causing intense leucocytic reaction and giving rise to a tremendous lymphocytosis, an upheaval which has also produced a disruption of all natural barriers, ties and shelters of parasites causing their widespread dispersal and distribution.

We are thankful to Dr. D. C. Chakravarty, M.B.E., r.R.C.S.E., Superintendent, Lake Medical College Hospital, Calcutta, for his kind permission to report this case. We also thank Dr. J. Banerji, M.B., Professor of Pathology, for his kind co-operation.

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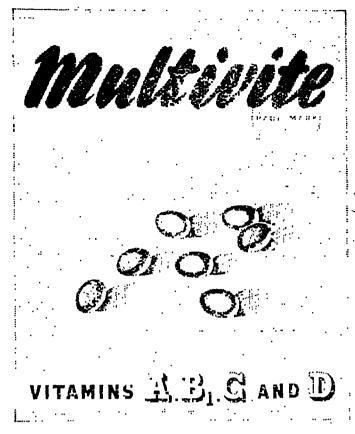
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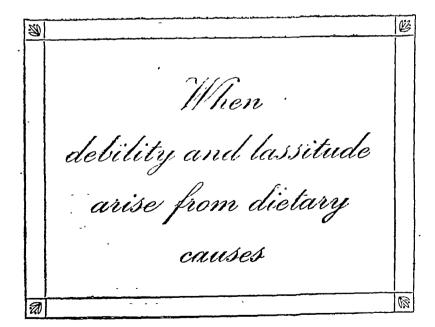
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# Indian Medical Gazette

#### DECEMBER

# THE KING'S HEALTH

THE King has been suffering from defective circulation in the legs, specially in the right leg.

The first reassuring news from specialists on the subject has just become available in the current medical literature (British Medical Journal, 4th December, 1948, p. 988; The Lancet, 4th December, 1948, p. 898).

Arterial circulation of the feet is 'being encouraged by appropriate medicinal and physical measures'. 'Some improvement has already taken place and there is less cause for immediate anxiety regarding the right foot'.

'As a result of relief from walking, standing, and fatigue, improvement in the general health of the King is apparent'.

These statements were issued over the signature of 5 medical men on 29th November, 1948.

### ALLERGY: NEWER KNOWLEDGE

ANAPHYLAXIS or protein sensitization producing dramatic results was observed as an immunological surprise in experimental work in 1902. A second injection of foreign proteins, the assaulting dose, 10 days or so after the first injection, the sensitizing dose, instead of producing a stronger antiserum, killed the animal with an amazing rapidity by the violence of the reaction.

The term allergy was coined in 1906. Clinical allergy was recognized some 30 years ago (Alexander, 1947a). It was on the whole a milder form of anaphylaxis Asthma, hay fever and urticaria were all traced to antibodies in the serum, which could be demonstrated by skin tests. The medical world wondered at the skill of its pioneers. Then came the antigen-antibody explanation, incongruities in the explanation, and many associated considerations.

The antigen-antibody explanation.—The morbid process in allergy is the same as that which occurs in anaphylaxis. The antibody is found in two localities: (1) in the blood stream as free antibody, and (2) in the tissues as fixed antibody. The undesirable reaction occurs in 3. stages: (1) The antigen in the assaulting dose unites with the antibody in the tissues and probably forms a precipitate. (2) The precipitate (or whatever may be the product of the union) injures the tissues and liberates a histamine-like substance. (3) The histamine-like substance acts on, the histamine-sensitive tissues and upsets their physiology. The histamine-sensitive tissues vary in their location in different animals. This accounts for

the difference in symptoms of anaphylaxis in different animals (Topley, 1933).

The union between the antigen and the antibody can occur only when there is more of the fixed antibody than of the free antibody; that is, when the free antibody cannot engage all the injected antigen.

Incongruities in the explanation.—Flaws have. been found in this explanation specially in explaining desensitization: (1) It has been said that freedom from anaphylactic shock assumes greater avidity for the antigen of the free antibody than of the fixed antibody; while the opposite must be assumed in the desensitization of the sensitized animal by minute doses of the antigen which the fixed antibody can pick up in competition with the free antibody. Such plasticity is really not necessary. The single assumption that the fixed antibody being nascent is stronger of the two will suffice. It picks up the minute dose which the free, the weaker antibody, fails to pick up at times, in spite of the advantage of prior contact. This reaction is quite common in precipitin sera prepared for detecting the source of blood in stains. A standard antiserum gives a precipitate with a 1 in 40,000 dilution of the blood sera while a weaker serum does not do so. In desensitization the minute dose of the antigen. picked up by the stronger fixed antibody forms. a pattern (vide infra) which later saves the cells from injury and prevents formation of the histamine-like substance which acts on the histamine-sensitive tissue in the body. Either the formation of a heavy precipitate is prevented. or the violence of the impact of its particles on the cytoplasm is reduced by the trapeze of the pattern. (2) It is an observed fact that in cases of multiple sensitivity desensitization with one of the antigens (which would exhaust only one specific antibody in the cells) renders the sensitive subject non-sensitive to other antigens also. It may, however, be suggested again that the pattern made by one of the antibodies; in the cells with the minute dose of the corresponding antigen excludes violent reactions and precipitate formation by any antigen with its corresponding antibody.

- Unity or diversity of antibodies. - It has been . suggested that the union between the antigen and its antibody is accomplished by the attachment of the molecules of the latter to the formerin different patterns. The difference depends on the selective concentration of both, presence of complement, reaction of the medium, presence of other arganic and inorganic constituents in the medium, temperature and other-accidental conditions which have nothing to do with the specificity. of the antigen-antibody reaction (Bronfenbrenner, 1948). The diverse manifestations of the reaction seen at different times under different conditions may be due to one of these conditions. A qualitative difference may exist due to: the antibody being produced in different classes of

animals. Antiserum produced in chickens, against the serum, does not fix with the serum complement derived from a guinea-pig; while an antiserum produced in rabbits does so readily and provides an instance of the strongest complement-fixation reaction, if not the strongest reaction in immunology (Greval, Bhattacharji and Das, 1946). Obviously this is due to the different composition of the different animals with respect to 'constituents other than antibody globulin' (Bronfenbrenner, loc. cit.).

Early antibody may be 'monovalent', giving only one type of reaction, and may become later, on the progress of immunization, 'polyvalent' (giving several types of reaction). Later still it may even become less effective, as has been described in connection with anti-pneumococcus horse serum with respect to its power of saving mice infected with pneumococcus (Godner and Horsfall, 1935). Incidentally, in the case of the antivenene (produced in horses), the hæmolytic amboceptor (produced in rabbits) and precipitin containing antisera (produced in rabbits) no such falling off is seen.

The anti-Rh bodies, agglutinating and 'blocking', show yet another kind of change of action.

Nature of antigen.—Typically anaphylaxis is brought about by parenteral entry of horse serum into a guinea-pig. This is the most dramatic form of the reaction and the antigen used is the surest of antigens. Less severe reactions occur in other animals with other proteins. Even a non-protein moiety of the large protein molecule may act as an antigen. Some antigens can both produce and neutralize an antibody, others can only neutralize it. The latter are called haptenes.

Disintegrated bacterial bodies, from foci of chronic infections, supply bacterial antigens to sensitize the body.

Certain articles of food and certain drugs under certain conditions may act as antigens. Even chemicals may act similarly by denaturing the body protein which then act as antigens. The sensitizing antigens are also known as allergens.

Naturally occurring antibodies.—Some antibodies occur in the system naturally. They are both specific and non-specific ( $\beta$  lysins, leukins and plakins). The former are concerned in allergy and are the bases of food allergy and drug idiosyncrasy. They have also been called reagins.

The substance in the human blood responsible for the Wassermann reaction is also called a reagin, although it does not occur naturally but only as a result of infection.

Naturally occurring antibodies may be produced by substances entering the body through alimentation or respiration. Specific antibodies against certain bacteria may be thus produced by small doses of those bacteria or by even the

same constituents entering as food. A mere biochemical maturation of the body may, also produce them as defence characters, appearing as variations and being retained through natural selection.

Some of these antibodies can be detected by skin tests, others cannot be so detected.

Various kinds of allergy: (1) Serum allergy.—Naturally occurring antibodies against horse serum are responsible for the immediate type of serum reaction which may be fatal. The reaction occurs on the first contact because of the naturally occurring antibody. Further, the reactivity of the natural antibody is more than that of the one produced as a result of a previous injection: death from serum reaction is not so uncommon as true anaphylaxis in man.

In America, about 10 per cent of all cases are sensitive to horse serum. This condition has, therefore, been called *physiological* or *normal* allergy, as opposed to *pathological* or *hereditary* allergy like asthma, hay fever, eczema, angioneurotic ædema, etc.. (Alexander, 1947b).

- (2) Pollen allergy.—This is the typical hay fever. Other foreign proteins, etc., taken into the system with inspiration, act in the same way. House dust is specially important although the actual offending antigen in it is still unknown. The dust has not been found to vary with the locality in America although it may vary with buildings (Black, 1948).
- (3) Food allergy.—The condition may run in families. It may also appear, disappear and reappear.
- (4) Drug allergy.—This is idiosyncrasy. The symptoms caused are not due to the pharmacological action of the drug. Skin tests are generally negative. They are positive in the case of tobacco in the great majority of cases of thrombo-angiitis obliterans.
- (5) Contact allergy.—This depends on the sensitization of the skin by contact with organic and inorganic chemicals or foreign proteins, etc. Usually it develops with time and is seen typically in industrial workers. Articles of dress may produce it, including silk which is insect saliva. The chemicals act by denaturing the body proteins which then act as foreign proteins. The foreign proteins or protein products are, of course, the ordinary antigens.
- (6) Physical allergy.—Histamine-like substances can also be produced in the body by the action of heat, sunlight, cold, effort and mechanical irritation. Probably this occurs only in subjects who are allergic from other causes (hypersensitive to some antigen). Drowning of good swimmers may result from syncope caused by allergy to cold (Black, loc. cit.). The soldier's heart (effort syndrome) has also been brought under allergy. The effort probably operates by generating heat. Dermatographia is

well known. The usual reactions of allergy can be obtained in all cases of physical allergy, by special tests. The allergy fluctuates with seasons: a subject hypersensitive to sunlight in summer tolerates it well in winter. Failure of acclimatization is mainly a matter of physical allergy, although the local fauna and flora also play a part.

(7) Entomogenous allergy.—Bits of bodies of insects or their venom may sensitize by inhalation or as in contact allergy, or even kill, as in serum allergy.

(8) Bacterial allergy.—Though mentioned last it is of prime importance: so much so that it may play a part in all infective diseases, thus: (i) entry of organism = 1st contact; (ii) incubation period =: latent period = development of hypersensitiveness; (ii) the acute disease = assault; and (iv) recovery = immunity. In rheumatic fever and tuberculosis the early manifestation of the disease (tonsillitis and infantile form of tuberculosis) and the later manifestations are separated by long and well-defined intervals, but in other diseases the interval is short and not well defined.

Workers in asthma have invented two more names in allergy: (i) Extrinsic allergy. In this form the skin tests indicate the allergin. (ii) Intrinsic allergy. In this form the skin tests are negative. In other words the allergy is due to substances which are manufactured in the system itself. Consequent on this conception, other differences like the presence of eosinophilia in the extrinsic form and its absence in the intrinsic form were described (Criep, 1945). Workers of experience, however, have come to the conclusion that asthma is best described as (a) non-infective asthma in which skin tests with various known allergens are positive and (b) infective asthma which is really due to bacterial allergy (Cooke, 1945).

Tuberculin-positive subjects are also cases of bacterial allergy; and so are Schick pseudoreactors. The reaction is caused by the hypersensitiveness to the body-protein of the bacteria

concerned, as opposed to their toxins.

Is hypersensitiveness a liability or an asset? Strong Schick pseudo-reactors have been proved to be immune (Parish, 1948). The hypersensitiveness must be an asset. Among nurses and medical students it is the tuberculin-negative subjects that need care, not the tuberculin-positive subjects: the hypersensitiveness again must be an asset. The present world-wide campaign against tuberculosis aims at turning every tuberculin-negative subject into a tuberculin-positive one (Heaf and Rusby, 1948). The hypersensitiveness is only a stage in the development of immunity. Almost every infant gets infected with tuberculosis but most of them grow into immune boys and girls, and later into immune men and women.

This is the position in human affections. In experimental work on animals it has been

claimed that allergy (hypersensitiveness) can be dissociated from immunity (Rich, A. R., Jennings, F. B., Jr., and Downing, L. M., quoted by Hadfield and Garrod, 1947). The following facts have been brought forward as evidence: (1) Immunity can be established without allergy. This is done by using the intravenous route for inoculation. Such a route, whatever be its merits, is not a natural route. (2) Immunity can be passively transferred without transferring allergy which accompanied it in the original animal. This really is no proof of the claim at all in view of the part played by the free and fixed antibodies. (3) Allergy can be abolished leaving immunity intact. This, again, is no proof for the same reason.

Is a known tuberculous member in a family which lives hygienically a liability or an asset to the children? The unexpected answer to this apparently unintelligent question was provided by village settlements of tuberculous families in England (Briegger, 1944; Burn, 1947).

of 108 children born in the village as many as 55 presented no clinical or radiological evidence of tuberculosis; 53 showed evidence of past infection. The findings of the years 1926, 1927, 1932 and 1933 already quoted are confirmed by additional years of experience. None of the village-born children (and more have now come of age) has, while a member of the community, contracted tuberculosis of the lungs, glands, bones or joints, or, indeed, in any known clinical form. These are remarkable results (Macnalty, 1944).

This answer is worthy of consideration. In our country there appears to exist a tuberculosis hyperconsciousness. It is being said that there is a heavy incidence of tuberculosis; that the incidence is increasing; and that the only solution lies in building of sanatoria to isolate the infected population. We doubt the first two assertions and disagree with the third. If the incidence is really heavy, the isolation, for all practical purposes, will be impossible for years to come. If the heavy incidence is also increasing, the isolation, for all practical purposes, will be impossible for more years to come. For these reasons alone some other method of saving our teeming millions from early death should be found. If such a method has been found elsewhere it should be adopted. The aforesaid answer provides the other method. Minute doses of infection will immunize the children like BCG vaccine. Massive doses will be avoided by hygienic living in the settlement. The affected parent will also live and work as a useful member of the community. A wage-earner out of work is a depressed subject in whose flesh and blood forces of immunity do not develop.

With the planned increase in industry an undoubted increase in the incidence of tuber-culosis may occur in the near future in the slums of foci of industry. As the foci are still in blue-print, hygiene, forewarned, should be

fore-armed against the establishment of the slums in the foci.

One antigen from a focus causing allergy against several antigens.—Such associations are known to exist. A small focus of a low-grade infection stimulates the reticulo-endothelial system which picks up any antigen available and makes an antibody against it. The proper treatment is the eradication of such a focus usually in the nose (Todd, 1946).

Chronic focal infection of several kinds produces similar well-known patterns of disease through allergy.—Thus are produced periarteritis nodosa, scleroderma, dermatomyosites, disseminated lupus crythematosus, the Libman-Sacks' syndrome and other related conditions (Alexander, 1947a). This condition has been called vascular allergy. Nephritis can also be included in the list. Lymphogranuloma inguinale, acting similarly, has recently been held responsible for vascular disease (Davies, 1947).

Synergy between antigens.—The antigens linked together appear to act together also. Tonsillitis, bronchitis and worsening of a patch of ringworm may all result from an offending article of diet in an allergic subject.

Competition between antigens.—More than three antigens may so overwhelm the system that it may not produce a strong antibody against any of them. Even two of them may weaken each other's power to produce an antibody. This is specially seen in iso-immunization in pregnancies. An Rh-positive husband iso-immunizes an Rh-negative wife more often when he can act as a donor of blood to her than when he cannot so act. Two incompatibilities fail to produce antibodies while one does not. A prophylaxis against iso-immunization (or severe iso-immunization) has been devised on this assumption. The expectant mother is given TAB vaccine which competes with the Rh antigen entering the circulation from the fœtus. A case has been reported in this journal (Ranganathan, 1948).

Anomalous specificity.—This is the unexpected 'specificity' between the sera of cases of typhus fevers and the various strains of Bacillus proteus, in agglutination. A suggestion has been made that the rickettsiæ may be cyclostages of the bacilli. In complement fixation the unexpected 'specificity' is seen in the Wassermann reaction and the reaction of the sera of cases of kala-azar and leprosy with an extract of tubercle bacillus (Greval, Lowe and Bose, 1939; Greval, Sen Gupta and Napier, 1939).

Skin reactions.—In them two different processes are involved: (1) Neutralization of the toxin by the antitoxin. This occurs in a negative Schick test when the toxin introduced is neutralized by the antitoxin in the system of the subject who is immune. In negative Dick test

also the toxin introduced is neutralized. In the Schultz-Charlton blanching test the antitoxin introduced neutralizes the toxin in the skin. (2) Allergic response. This occurs in a positive tuberculin test when the skin of the subject is sensitized by the tubercle bacillus. Other examples are the Arthus phenomenon (local anaphylaxis) and the Shwartzman phenomenon (also local anaphylaxis on a 'prepared' site; not accepted by Shwartzman). The pseudoreaction in the Schick test and the Dick test is also allergic. Many skin and eye diseases are allergic.

Sympathetic and para-sympathetic systems.— The antigen-antibody reactions are thought to cause para-sympathetic stimulation which releases a histamine-like substance from the cells. Adrenalin used in this treatment stimulates the sympathetic system which overcomes the para-sympathetic system (Alexander, 1947a; Bray, 1948).

Species-specific and organ-specific allergy.— Endophthalmitis phacoanaphylactica is an inflammatory reaction in the eye following trauma to the lens or after operation for cataract in cases in which lens substance remains in the eye. The lens protein acts as an organ-specific antigen which forms an antibody (Cooke, loc. cit.). The paralysis following the brain vaccine treatment, as a prophylaxis against rabies, is attributed to the development of an organ-specific antibody which acts on the nervous system of the patient (Rivers, 1948).

The species-specificity in the two instances is suppressed under two different conditions by the organ-specificity. The lens substance acts as an antigen in spite of the fact that the lens belongs to the same individual: It should not act because of the same species, but it acts. The antibody against the nerve tissue of the rabbit (or sheep) used for making the vaccine acts on the nerve tissue of a different species, i.e. man: It should not act because of a different species, but it acts.

Treatment of allergy.—This consists of cure and/or relief.

For the cure the measures taken aim at producing immunity by specific or non-specific means.

For the relief the measures taken aim at: (1) Stimulating the sympathetic system. Adrenalin, ephedrine, similar synthetic preparations and benzedrine accomplish this purpose. Recently ergotamine has been used almost as a specific in migraine (which, incidentally, can also be caused by allergy). Nanthine compounds are also known to give relief in migraine and asthma, black coffee being a very convenient remedy. Aminophylline has been found useful when other drugs have failed (adrenalin fasteness is known). It is available under several mames (thiophylline and thiocine, in: confibination with other therapeutic preparations).

.. 1 : - *

(2) Inhibition of parasympathetic activity. Atropine, belladonna, hyoseyamus and strammonium accomplish this purpose. (3) Producing narcosis of varying degrees. Opium accomplishes this purpose. The prejudice against opium is mostly a matter of fashion. For the damage caused in the West by morphine, opium cannot be held responsible. Used with caution and for strictly therapeutic effects it is one of the best remedies. Even addiction is not half so harmful as the one to alcohol. It used to be issued as a ration in the Indian Army before the World War I. when stamina, endurance, agility and awareness won battles and wars, unaided by the aeroplane, tank and radar. Demerol, cocaine and other local anasthetics (for local application) also come under this heading. (4) Production of general anasthesia. It was believed for some time that anaphylaxis did not occur while the subject was under a general anæsthetic. A death, however, has been reported from the use of tetanus antitoxin while the patient was under ether, and experimental work against the idea reviewed (Quill, 1937). Averting per rectum has given good results in asthma. It has even removed adrenalin fastness. Cases of asthma have improved after a surgical operation under ether. (5) Counteracting deficiency. Women are specially liable to suffer from allergy at certain periods. Theelin cures urticaria and angioneurotic ædema in them after menopause. Infrequent coincidence of asthma and diabetes is known. It depends upon the antagonism between insulin and adrenalin. Pituitary extract, spleen extract and cortical hormones have been tried for similar conditions. (6) Counteracting avitamino-. ses. Vitamin C and D have been used with good results. (7) Modifying biochemical metabolism. Calcium, acid therapy hydrochloric or dilute nitro-hydrochloric acid) and glucose are given. (8) Changing environment. This measure is worthy of trial. In India, extremes of climate and other associated special features are available within 48 hours from anywhere, at a moderate cost, in normal times. (9) Leaving the allergen alone. It can be done by trial and error. The allergen may be associated with food or work. (10) Suggestion. Psychotherapy has a place in allergy, specially between attacks of asthma. This, however, is no aspersion on cases of allergy. The allergic subjects must possess an adequately functioning nervous system. In America, the disease while affecting about 10 per cent of the general population is hardly ever found in lunatic asylums (Black, loc. cit.).

Histamine and anti-histamine substances like benadryl and pyribenzamine are being used both for cure and relief. Autohamotherapy, autoserotherapy and auto-urinary proteose therapy can also be brought under the same heading. Histaminase has not been a success.

All diseases may not be due to allergy.-One such disease is cataract. Rothmund's syndrome,

Werner's syndrome and cataracta dermatogenes led to cataracta allergica. Workers of experience, however, conclude that nutritional and hereditary factors afford a better explanation (Cooke, loc. cit.).

An important difference between anaphylaxis and allergy.—It must be realized that the maximal antigen-antibody reaction as obtained in anaphylaxis could not possibly have been acquired as an asset in the course of evolution. The parenteral entry by injection is equally unnatural. On the other hand allergy by infeetion, inhalation or food is a natural and likely occurrence. It immunizes ultimately most of the subjects affected and is likely to have been evolved and preserved in the course of evolution.

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#### MEDICAL EDUCATION

It is proposed to publish articles on the above subject as a special feature in a future issue. Contributions in this connection will be received until the 31st March, 1949. Educationists, critics and others are expected to give their best in this important subject.

#### INDEX FOR I.M.G., VOLUME 83 (1948)

The index for volume 83 (1948) will be printed and included in the January 1949 issue. Subscribers are requested to detach it and bind it along with volume 83.

### Medical News

CARE OF THE BLIND IN INDIA

AWARD OF 400 RUPEES offered by

Dr. R. U. Hingorani
128, Harley Street, W.1
London, England

FOR THE BEST ESSAY

received by him before 30th June, 1949, on 'THE FUTURE CARE OF THE BLIND IN INDIA.'

Entrants may be of any nationality, of either sex and of any age or occupation. There is no limit to the length of the Essay, but it must cover the following points:—

- 1. Registration of the Blind, i.e. best method of inducing people to register their blind children or other relatives.
- 2. Duty of private citizens and duty of State to the Blind.
- 3. Education and occupation of the Blind.
- 4. Welfare of the Blind in their own homes.
- 5. Provision of permanent settlements for the Blind.
- 6. Best method of educating public in prevention of blindness.

#### CONDITIONS OF ENTRY

- 1. All Essays must be in English.
- 2. No Essays will be returned to the writers and no correspondence can be entered into.
- 3. The prize-winning Essay will become the property of Dr. Hingorani to be used as he may think fit.
- 4. All entries must be sent to Dr. Hingorani at the above address.
- 5. The closing date for receipt of entries is 30th June, 1949.
- 6. Dr. Hingorani's decision will be final.
- 7. The Indian Press will be notified of the result on 31st August, 1949, and a cheque will be sent to the successful competitor by registered post on the same date.

40 MILLION PEOPLE GET FREE MEDICAL AID (From Release No. B.F. 418 issued by the British Information Services, New Delhi)

NINETY-THREE per cent of the population of Britain are getting skilled medical treatment free under the National Health Service. Some 40,000,000 people are registered with doctors who are working in the Service. This was announced at the opening of the London Public Health Exhibition.

In England and Wales, over 18,000 doctors out of 21,000 are co-operating in the National Health Service, and more than 8,500 dentists out of 10,000. There are also 5,000 opticians and 14,000 chemists.

The amount paid to dentists on 13th October, for work they had completed, was £4,750,000 (Rs. 632 crores) as against an estimate of £7,000,000 (Rs. 9.32 crores).

STILL-BORN BABIES BROUGHT BACK TO LIFE ROCKING CREATES ARTIFICIAL RESPIRATION

#### By JOSEPH KALMER

(From Release No. B.F. 423 issued by the British Information Services, New Delhi)

Every mother, midwife and nurse knows that rocking will soon induce a restless infant to sleep. In the British Medical Journal, Dr. E. C. Eve reveals in detail that the same method can be applied to revive an apparently lifeless baby after birth.

In 1932, Dr. Eve published an article describing the rocking method of artificial respiration. The late Dr. N. C. Forsyth, who died last year, used this method to revive newly-born babies suffering from white asphyxia.

While the usual sign of asphyxia is cyanosis, in certain cases such as electrocution, drowning, or babies strangled by the umbilical cord, it is characterized by a wan look, technically known as 'white asphyxia'. This condition is caused by an excess of carbon dioxide and a shortage of oxygen in the blood.

Dr. Eve noticed when he rocked a victim of drowning that the movement restored the pink colour to his cheeks, and concluded that in the process an artificial circulation, adequately supplied with oxygen, had been created and maintained.

Dr. Forsyth—upon whose findings Dr. Eve's new work is based—made the same observation in 11 cases of apparently still-born babies. The colour rose in the babies' cheeks before their first gasps. The rocking had restored circulation to the respiratory nerve cells, whereupon the respiratory muscles became active and gasped for air. As the lungs of a newly-born babe are unexpanded, they can only supply sufficient oxygen to the nerve cells if the latter's blood is renewed by circulation. Immobility of the lungs and accumulation of carbon dioxide soon prove fatal.

#### THE FIRST ESSENTIAL

For this reason the doctor's first aim is to start the lungs working so that the body can breathe. Dr. Eve's method has proved beyond all doubt that the first essential is to promote circulation to the nerve cells, whereupon respiration follows.

In view of the fact that circulation of the blood can be promoted by rocking, the cerebral blood, which is stagnant in quiescence, is brought into motion. The valves of the heart ensure movement towards the heart which in turn influences the lungs and promotes breathing.

The rocking method has also shown that there is no cause for fear that rocking is harmful to a newly-born child—on the contrary, the baby should not be left in peace 1 Of the 11 cases of white asphyxia in which Dr. Forsyth applied the rocking method of treatment, eight were due to strangulation of the umbilical cord. Thus the nerve cells had been robbed of oxygen.

It is not always an easy task to get babies to breathe. The first baby treated by Dr. Forsyth had to be rocked for 35 minutes before it took its first breath of air. Dr. Forsyth rocked it in his arms, sitting in front of a fire. Later on he changed his tactics and remained standing, still rocking the baby. The details are fully described by Dr. Eve for the information of gynecologists.

The work of Dr. Eve and Dr. Forsyth have aroused great interest in this method of artificial respiration which enables the lives of some 10,000 newly-born babies, suffering from asphyxia, to be saved every year. This estimate is by no means evaggerated when it is considered that in the United States alone, some 30,000 newly-born infants die annually of asphyxia.

#### 95 PER CENT PASS T.B. TEST

(From Release No. B.F. 404 issued by the British Information Services, New Delhi)

Of the 2,000,000 persons examined by mass radiography in Britain during the past year, 95 per cent had normal chests. Only four per 1,000 had active pulmonary tuberculosis. One per 1,000 had bronchiectasis, a chronic and disabling condition of the lungs.

These details are given in the annual report of the National Association for the Prevention of Tuberculosis. The report suggests that each regional hospital board should have a permanent committee and a doctor 'of high clinical and administrative ability' to co-ordinate a complete service for tuberculosis and chest diseases.

#### WHAT IT COSTS TO HAVE A BABY

(From Release No. B.F. 438 issued by the British Information Services, New Delhi)

A REPORT just published in Britain reveals that the average manual worker's wife spent £36 (Rs. 480) on her first confinement and £23 (Rs. 306-9-0) on her second. The black-coated wage earner spent £45 (Rs. 600) and £30 (Rs. 400) respectively.

The report, entitled 'Maternity in Great Britain', surveys the social and economic aspects of child birth. This informative survey, drafted by a committee of the Royal College of Obstetricians and Gynæcologists, is based on interviews with 14,000 mothers.

Analysing the confinement expenses, the report points out that the pram, cot and baby's bath for the first child cost the manual worker £11 (Rs. 146-9-0), the layette another £10 (Rs. 133-5-0) and maternity garments nearly £7 (Rs. 93-5-0). The actual medical and hospital charges and other confinement costs for the first child did not greatly exceed £8 (Rs. 106-9-0).

Wealthy people spent proportionately more but an interesting factor is that all classes find that the first baby's cost is equivalent of six weeks' net income and subsequent births of between four and five weeks.

The report, in general, seems to show that the broad basis of maternity and child welfare schemes in Britain to-day is sound.

#### FINGER PRINTS AID MEDICINE

(From Release No. B.F. 598 issued by the British Information Services, New Delhi)

Research workers in Britain hope to prove that the study of palms is based not on myth but on science. In the first experiment of its kind the children of a Hertfordshire school are having prints taken of their fingers and palms as a measure to assist the study of genetics.

The general character of the main ridges in the palm, rather than minute details, will be studied. The research workers believe that some of the patterns on

hands are inherited, and that data obtained from this survey, may help in diagnosing hereditary diseases. This will be of great value to people about to marry. It has already enabled ailments to be diagnosed in infancy before other signs could be detected.

The school represents a cross section of normal, healthy children, and the experiments are under the supervision of Professor Lionel Penrose, Director of the Galton Genetics Laboratory at University College, London

THE SECOND COMMONWEALTH AND EMPIRE HEALTH AND TUBERCULOSIS CONFERENCE, CENTRAL HALL, LONDON (OPPOSITE WEST-MINSTER ABBEY), 5TH, 6TH, 7TH AND 8TH JULY, 1949

Open to all interested in preventive medicine, including doctors, commercial and industrial executives, nurses, social workers, health administrators, members of public authorities, Regional Hospital Boards, etc.

#### PROVISIONAL PROGRAMMD

- * Tuberculosis as a world problem.
- *Trends in the modern treatment for tuberculosis including Streptomycin and P.A.S.
- * Regional county tuberculosis schemes.
- *Organization of comprehensive tuberculosis schemes in a British colony.
- *Problems in the prevention and detection of tuberculosis:
  - (a) Tuberculosis among nurses and students.
  - (b) The policy of B.C.G. administration.
- * Psychological and social re-adaptation in industry.
- *Protection from bovine tuberculous infection.

Speakers will include distinguished personalities from Great Britain, the British Commonwealth, and other countries. There will be opportunity for members of the conference to address the assembly.

Fees.—The conference fee is three guineas for four days, or one guinea for a single day or session.

Transactions.—The proceedings of the conference will be published verbatim, and a copy will be supplied free to every member. Additional copies will be available, price 15s.

Travel and accommodation.—Messrs. Thomas Cook and Son, Ltd. are acting as travel agents for the conference, and their services are therefore at the disposal of conference members.

Exhibition.—A large exhibition of x-ray apparatus, pharmaceutical products, patients' handicrafts, medical and technical books, maps, plans, etc., will be open during the conference.

Entertainments and visits.—Entertainments and visits to sanatoria, hospitals, clinics, and places of general interest will be arranged for conference members. A small supplementary charge for travel will be made in connection with some of these visits.

Further particulars may be obtained from the Secretary-General, the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1, England.

THE DR. B. S. SHROFF MEMORIAL GOLD MEDAL OF THE BOMBAY MEDICAL UNION, 1948

THE following subject has been selected by the Bombay Medical Union for competitive thesis for the above prize for 1948.

'Prevalence, etiology and treatment of Filariasis (Elephantiasis)'.

The award will be in the form of a Gold Medal called the Dr. B. S. SHROFF MEMORIAL GOLD MEDAL of the BOMBAY MEDICAL UNION.

The competitor must be (i) a duly qualified member of the medical profession holding a degree or degrees and diplomas from Indian and other universities created by statute, or (ii) a duly qualified member of the medical profession holding the Diploma of Membership of the College of Physicians and Surgeons of Bombay.

The thesis must be sent in three clear typed copies so as to reach the Honorary Secretaries. Bombay Medical Union, Blavatsky Lodge Building, French Bridge, Chowpatty, Bombay 7, by the 30th June, 1949.

The thesis should be designated by a motto instead of the writer's name and should be accompanied by a sealed cover containing the name of the writer and his post-office address.

The name of the prize, the year of the competition, the subject of the thesis, and the writer's motto should be superscribed on the cover.

No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and no contribution offered in one year will be accepted in any subsequent year unless sit includes evidence of further work.

The accepted thesis shall be the property of the Bombay Medical Union.

All other thesis shall be returned if not accepted provided the return postage expenses are paid in advance by the writer.

In the award of the prize to the successful candidate, the decision of the committee shall be final.

N. J. MODI. R. A. VAIDYA, . It. Hon. Secretaries,

Bombay Medical Union.

Bombay, 5th August, 1948.

## THE DR. SIR BHALCHANDRA KRISHNA, KT., MEMORIAL GOLD MEDAL OF THE BOMBAY MEDICAL UNION, 1948

Ar a meeting of the sub-cribers of Sir Bhalchandra Krishna, Kt., Memorial Fund, held on the 11th July, 1948, the following resolution was adopted:

"That from the funds collected to perpetuate the memory of the late Dr. Sir Bhalchandra Krishna, Kt., a memorial prize medal be founded to be awarded a memorial prize medal be founded to be awarded every year on the anniversary of his death to a member of the medical profession* who submits a thesis or delivers a lecture on any medical subject before a meeting of the medical profession to be held under the auspices of the Bombay Medical Union, preference to be given to one who submits any original or research work especially with reference to indigenous medicine on western lines.

In consonance with the above resolution, members of the profession are invited to submit a thesis or a paper by the 30th June, 1949, to the undersigned for submission to a Selection Committee for making the above award.

The thesis should be designated by a motto instead of the writer's name and should be accompanied by a sealed cover containing the name of the writer and his post-office address.

*A member of the medical profession means:-All duly qualified members of the medical profession holding degrees and diplomas from :-

(a) Indian universities created by statute; and

(b) Such other universities and corporate bodies as the managing committee may from time to time determine subject to the approval of the general body of the union; and

(c) Duly qualified members of the medical profession holding diploma of membership of the College of Physicians and Surgeons of Bombay.

The name of the prize, the year of the competition. the subject of the thesis and the writer's motto should be superscribed on the cover. Two or three copies of the thesis should be submitted.

The thesis or paper shall have to be read by the prizeman on the day of the award at a meeting of the profession to be held in accordance with the above resolution. , ,

> N. J. MODI. R. A. VAIDYA. Jt. Hon. Secretaries. Bombay Medical Union.

BLAVATSKY LODGE BUILDING. FRENCH BRIDGE, CHOWPATTY, Bombay, 5th August, 1918.

THETWELFTH BRITISH CONGRESS OBSTETRICS AND GYNÆCOLOGY

6TH, 7TH AND STH JULY, 1949

To be held in the Friends Meeting House, Euston Road, London, N.W.1

President: Sir Eardley Holland. Hon. Sees.: A. Joseph Wrigley. Ian Jackson.

3. Queen Anne Street (Royal College of Obstetricians Gynæcologists), . London, W.1;

Wednesday, 6th July.

Morning Session. 10.0 a.m. (Chairman: The Presi-

The Congress will be declared open by the Minister of Health.

Cæsarean 'Section'. Introduced ' Modein Mr. C. McIntosh Marshall (Liverpool).

Afternoon Session, 2.0 p.m. (Chairman: Professor Hilda Lloyd.)

. (1) Guest Paper ('Endometriosis'). Dr. Joe Meigs (Boston, Mass.).

(2) 'The Methods of Assay and Clinical Significance of Pregnanediol in the Urine'. Introduced by Professor C. F. Marrian (Edinburgh) and Dr. G. I. M. Swyer (London). . . . .

8.45 p.m.

Reception by the President and Council of the Royal College of Obstetricians and Gyna-cologists at the University of London, Bloomsbury, W.C.1.

THURSDAY, 7th July.

Morning Session. 10.0 a.m. (Chairman: Sir William Gilliatt.)

'Essential Hypertension in Pregnancy', Introduced by Professor George W. Pickering (London) and Professor F. J. Browne (London).

Afternoon Session. 2.0 p.m. (Chairman : Dr. John Hewitt.)

(1) 'The Management of Pregnancy in Diabetics'.
Introduced by Mr. John H. Peel (London) and
Dr. G. Douglas Matthew (Edinburgh).

(2) 'Hernia of Pouch of Douglas'. Introduced by Mr. Charles D. Read (London).

8.0 p.m. to 10.30 p.m.

Reception by the President of the Congress at the Zoological Gardens by courtesy of the Council of the Zoological Society of London.

FRIDAY, 8th July.

Morning Session. 10.0 a.m. (Chairman: Professor O'Donel T. D. Browne.)

'Modern Concepts in Diagnosis, Treatment and Prognosis of Carcinoma of the Uterus'.

- (1) 'The Diagnosis by Vaginal Smear'. Dr. J. E. Ayre (Montreal).
- (2) 'Pre-Cancerous Cellular Changes in Carcinoma of the Cervix'. Professor Gilbert I. Strachan (Cardiff).
- on Biopsies', Mr. based (3) 'Prognosis Glucksmann (Cambridge).
- (4) 'The Operation of Pelvic Eventeration'. Dr. Joe Meigs (Boston, Mass.).

A Discussion will follow each Paper.

Afternoon Session. 20 p.m. (Chairman : Dr. E. Chalmers Fahmy.)

Discussion on Maternal Mortality. Introduced by Sir William Gilliatt (London).

7.45 p.m.

Congress Banquet in Guildhall.

Owing to the difficulties that exist at the present time in arranging hotel accommodation, travel, etc., will all those who hope to attend please apply as soon as possible to Ian Jackson, M.R.Co.a., Hou. Sec., 58, Queen Anne Street (Royal College of Obstetricians and Gynæcologists), London, W.1.

IA preliminary notice of this Congress was published in the I.M.G., 89, 426.—Enrron, I.M.G.1

#### HOW BACTERIA PROPEL THEMSELVES

Australian Researches with Electron Microscope REVEAL SECRETS

#### By CHARLES LYNCH

(From Release No. P./1012 offered by the Public Relations Officer, Australian High Commissioner's Office, New Delhi)

INTERESTING information upon the movements of bacteria has been revealed as a result of laboratory research with an electron microscope in Melbourne, Australia.

The microscope, which was imported from the United States of America, is installed at the laboratories of the Australian Council for Scientific and Industrial Research in Melbourne.

Bacteria are microscopic organisms which have no chlorophyll and consequently are unable to synthesize food from simple organic materials. Their multiplica-tion is so rapid that they may reproduce more than 16,000,000 a day and they are so minute that about 2,500 of some of the larger forms, placed end on end, would measure only one-tenth of an inch.

One of the problems that have occupied the attention of bacteriologists is the means of propulsion used by bacteria. Most species are believed to be incapable of independent movement and depend upon air currents or water for their transport. A few bacteria can swim, and the pictures obtained in Melbourne show clearly tiny bairs or flagella by means of which they can propel themselves along.

The classification studied is the Bacillus subtilis, and the photographs taken by the Australian CSIR show that the tiny hairs are less than one millionth of an inch in diameter.

Although invisible under the most powerful optical microscope their presence has been suspected for some time.

A study of the photographs by experts in Melbourne has led them to the conclusion that the bacteria curls its flagella together to form a fish tail which it uses for swimming. Further studies are being carried out with the aid of the electron microscope, one of the most powerful research tools of modern science.

In the ordinary microscope subjects viewed by the eye result from a reflection of waves of light. Because some subjects are actually as small, or smaller than light waves, to make them apparent, light is substituted

for electrons, which make it possible to magnify objects a hundred thousand times.

The top of the electron microscope is composed of an electron gun—a hot cathode covered by an anode with a small hole in the centre. The electrons shoot out of this hole in a beam which takes the place of the light beam in the orthodox microscope.

There are no glass lenses and magnetic beams are used to focus the beam of electrons. The magnetic lens performs the same function for the electron beam, This lens is a coil of wire shaped like a doughnut and it focuses the beam on to the specimen. As the electrons strike the specimen, more or fewer pass through it, depending upon the density at the place of their impact.

They come out on the other side, in an electron pattern of the specimen.

The pattern is re-focused and enlarged, after which a small part of that enlargement is enlarged again by another magnetic lens. The final electron enlargement is projected on to a fluorescent screen, which gives off light when and where the electrons hit it. The screen gives off more light where there are numbers of electrons, and less where the density of the specimen prevents them getting through.

Photographs can be obtained by the use of a photographic plate instead of the screen.

The instrument at Melbourne is one of the most modern of its kind, and will be used for research upon the wide variety of problems upon which the Australian Council is concentrating in the interests of science and industry.

#### INDIAN PHARMACEUTICAL CONGRESS

(23RD AND 24TH DECEMBER, 1918)

Welcome Address

By D. N. ROY, p.sc., M.D., D.T.M. Chairman of the Reception Committee

Fellow workers in the health profession, delegates to the Pharmaceutical Congress, ladies and gentlemen :-

It is my privilege this afternoon to welcome you at the School of Tropical Medicine, where you have decided to inaugurate the first Indian Pharmaceutical Congress. When the request to act as the Chairman of the Reception Committee came to me, I was a bit diffident as to whether suitable facilities could be offered for the holding of the meetings and deliberations in the limited space at my disposal at the tions in the limited space at my disposal at the School, and the demands on my time during this period of the year were so heavy that I felt at one time that I should excuse myself from accepting the responsibilities. On further reflection, however, it appeared to me that the advantages and opportunities of close content between the two sixty of the second contact between the two sister sciences of Medicine and Pharmacy, which the holding of this session in the School would offer would be well worth having and would largely counterbalance the disadvantages and inconveniences that might arise from lack of space and my other pre-occupations. One of my predecessors in office, Colonel Sir Ram Nath Chopra, was intimately associated with Pharmacy and contributed a great deal towards the uplift of this science in early days. The School has started and maintained for over 27 years a virile department of Pharmacology, where studies on Indian indigenous drugs and various aspects of Pharmacy and Pharmacology have been carried out, enriching the fields of nce in many ways. The Biochemic Laboratory (now the Central Drugs Laboratory under the Indian Drugs Act) which has done so much in the field of drug control and pharmacy and has received such wide recognition throughout India and outside it, is, figuratively child of the School of ropical . some of you might be

aware that the idea of drug control organization emanated from one of the workers of this Institution and, even to-day, the work of the Standardization Laboratory is being run by personnel largely trained in the School. The School of Tropical Medicine, therefore, is unique amongst medical institutions in India, having the tradition of pharmaceutical services, and it is to my mind, a very fitting coincidence that the first Pharmaceutical Congress should be held in its original home. I am sure it augurs well for the future, as a meeting of this nature is likely to set the seal for future active collaboration between the physicians and pharmacists—a collaboration which is likely to lead to the greatest good in the maintenance of the health of the nation.

#### Pharmacy in India

While I cannot claim to have an intimate knowledge of matters pharmaceutical, I have had during the last few days an opportunity of going through some of the recent literature on the subject in the library of my friend, Dr. Mukerji, the Director of the Central Drugs Laboratory. A perusal of some of these articles prompted me to make some comments before you, which may be worth while listening to, because it comes from an unbiased scientist who has no affiliation with any particular groups or interests. The Report of the Drugs Enquiry Committee, which was appointed by the then Department of Education, Health and Lands of the Government of India under the Chairmanship of Colonel Sir Ram Nath Chopra gives a picture of the status of pharmacy in India in 1930 as follows: 'The profession in India is represented by a class of people, whose status, functions and duties are ill defined and improperly understood. They compound and dispense medicines, including the most potent preparations and deadly poisons in many cases in complete ignorance of their properties and potencies. They also work as dressers, laboratory and hospital assistants, anæsthetists, operation assistants and also as male nurses in many mofussil hospitals and dispensaries. They also pose as doctors before the lay public. This is naturally a very unsatisfactory and deplorable state of affairs and is in sharp contrast with the status of pharmacy in Great Britain, the Continent of Europe, the United States of America and nearly all other civilized countries of the world. There is no difference of opinion that the status of pharmacy in India must be raised, if public health programmes and drug control activities are to proceed on proper lines towards improving the health status of future generations of India.

The problem is how this can be done. An analysis of the reasons for the deplorable state of affairs pictured above shows two outstanding defects, viz. (i) lack of pharmaceutical education and any form of compulsory qualifications and (ii) the absence of legislation to control pharmacy or to prevent the practice of pharmacy by unqualified persons. If these two defects are removed, there seems hardly any doubt that the problem could be effectively solved and the prestige of pharmacy in India could be raised to a level comparable with what exists in other countries.

#### Pharmacy Education

There appears to be a consensus of opinion amongst all those who have had more intimate contact with pharmacy than myself that the pharmaceutical education available in India is of a very poor order. In most provinces, the education is being managed by the Provincial State Medical Faculties, who only give a meagre education in these fields, just enough to make a 'compounder' and not a 'pharmacist' in the sense in which the word is employed in foreign countries. There are few opportunities also for obtaining pharmaceutical education and, under existing conditions, there is no incentive to study or to obtain any Degree in pharmacy, with the inevitable result that there are very few

qualified pharmacists in India and the few that are have to compete with the vast mass of unqualified persons. There are many chemists' shops employing compounders, but most of the compounders who dispense medicines earn a mere pittance, in many cases a little more than an ordinary coolie. The average compounder is poorly educated and therefore poorly paid. In many parts of India, the pay of whole-time compounders and dispensers employed in Government hospitals and dispensaries rises from Rs. 25 to Rs. 100 after 20 to 25 years of service.

It is however encouraging to note that of late significant changes are taking place and there is now a consciousness about the utility of pharmacy training in the sphere of education, drug control and drug industry. The Government of West Bengal appointed a Committee for the establishment of a College of Pharmacy as early as 1938 and recently another new Committee is functioning to bring the recommendations up to date, so that a College of Pharmacy could be established within as short a time as possible. With a view to providing for the rapid demands for trained personnel, there are now several Universities (Benares, Andhra, Bombay, Madras, Ahmedabad, East Punjab) which offer a graduate course in pharmacy. The Benares University is the first in India which started a regular course in pharmacy and many graduates are coming out of this centre every year. The recently started College of Pharmacy at Ahmedabad is doing very good work in the training of pharmacists. The necessity of qualified pharmacists however in this country to cater for the needs of the growing medical and public health organizations is so great that these steps are not considered adequate and, in the interest of pharmacy, much more emphasis should be laid in this direction. It is a pity that the Calcutta University has not yet been able to organize a College of Pharmacy, though Calcutta had played a great part in the development of pharmaceutical consciousness in the whole of India. I feel sure that as soon as the present chaotic situation in West Bengal is resolved, the University would take up this problem and see that a proper centre of pharmaceutical education is created in this province.

#### Pharmaceutical Legislation

With a view to protecting the qualified pharmacists from the quacks and charlatans efforts have been made to introduce legislation pertaining to drugs and pharmacy during the intervening period. On the recommendations of the Drugs Enquiry Committee (1930-31) a separate Drugs Act and a separate Pharmacy Act were suggested to be introduced in India. The Drugs Act was enacted in 1940 and the Pharmacy Act early this year, in 1948. It is the purpose of the Drugs Act to control the importation, manufacture, distribution and sale of drugs in India and it has recommended the creation of a machinery consisting of the Central Drugs Laboratory and Provincial Laboratories working in collaboration with the Central Drugs Laboratory and also an Inspectorate organization for the sampling, seizure, etc., of under-strength and adulterated drugs. If these organizations are to be run efficiently, the services of qualified pharmacists must be enlisted. The pharmacists are the ultimate purveyors of drugs and they also compound, dispense and distribute the drugs to the consuming public. Under the Pharmacy Act recently put into the Statute Book, there is provision for a Central Pharmacy Council, which, when constituted, will look after the interest of pharmacy, including pharmaceutical education, legislation and pharmaceutical trade all over the country.

#### The Future

That pharmacy is going ahead and is carving out for itself an established place in the academic and public health spheres is manifest from the number of Associations that are springing up in the provinces as well as on an all-India basis. The future of pharmacy in India promises to be great now that drugs legislation

and pharmacy legislation are already enacted and the Government of free India are keen to implement them to the best of their ability. Until last year, there was no legislation for control of pharmacy and the titles 'chemists' and 'druggists' had no significance whatsoever, as these were freely used by anybody who might choose to do so. There was nothing to prevent the most ignorant people from opening a chemists shop and dispensing the deadliest poisons, whilst the qualified chemists were not protected in any way. There were very few opportunities of obtaining pharmaceutical education. The inevitable result was that complete chaos existed in this field.

However, thanks to the pioneering work of several individuals and organizations, pharmacy is now in the picture in India and pharmaceutical activities are gaining momentum every day. The Government of India have recognized the status of pharmacy in India and have given scope for higher pharmacy training in foreign countries to promising pharmacy graduates of this country, and some of these scholars have recently returned to take up newer activities in this field. There is no doubt that pharmacy in India is in the midst of a trend, which already has substantially altered the hopeless state of affairs in which the profession found itself 15 years ago and promises even greater changes for the future. This trend is reflected in the rapid expansion of materia medica during the last 10 years, culminating in the use of sulpha drugs, antimalarials, influenza vaccines, antibiotics, etc. The use of these drugs naturally requires a large amount of detailed information and the need is now being increasingly felt of collaborative work between the doctors and the pharmacists trained on modern lines. If the trained pharmacist of to-day can hitch his wagon to the progressive phase of modern medicine and chemotherapy, his professional stature will certainly increase and along with it, medicine and public health will gain a great deal in achieving their rightful place in the scientific map of the world.

Before I close, it is my pleasant duty to offer a hearty welcome to the delegates who are attending the session of the Congress from outside Calcutta. It is gratifying to note that the Vice-Chancellor is taking interest in these activities and is also attending the Congress. This amply proves the growing interest of the authorities for development of pharmacy and pharmaceutical education in this country. There cannot be two opinions that pharmacy in all its aspect needs development, if India is to become self-sufficient in the matter of her drug requirements. We are passing through a transition period and this is fraught with tremendous possibilities for both building up or negation of all forward activities. If we do not take the opportunities now being offered to us in building up pharmacy, we may get into a situation which will retard the clock of development many years. There is no time to lose and we must make the best effort now. I am sure the deliberations of the Indian Pharmaceutical Congress would throw new light into the horizon and would help us in solving many crying difficulties that are in the way. I wish you the best of luck and every success in the first Pharmaceutical Congress and hope that many more such Congresses would be convened to solve the evergrowing problems in the field of pharmacy.

'JAI HIND'.

#### DETAILS ABOUT ICE-AGE MAN

(Abstracted from the Current Science, Vol. 16, No. 12, December 1947, p. 373)

The fossil remains of the 15,000-year-old Tepexpan man are being reassembled at the Smithsonian Institute in U.S.A.

Study thus far shows that this gentleman of the ice age was taller than his modern-day descendants. He is believed to have been about five feet eight inches

in height-well above the average-stature of modern Mexican Indians'.

The Tepexpan man, believed to be the oldest fossil human being, was dug up last February from an iceage swamp near the village of Tepexpan, which is not far from Mexico City.

The remains—parts of a skull, jaw bones, arms, legs and a few other odd skeletal pieces—were flown to U.S.A. late in June. They are being reassembled by Dr. Stewart and Dr. Javier Romero of the Mexican National Museum of Anthropology.

Dr. Stewart emphasized that no final conclusions can be drawn since only one Tepexpan man has been found—and he may have towered above his compatriots. He hopes another of his kind will be found to shed further light on this view.

The Tepexpan's teeth were also interesting. Although worn down badly, there are no signs of dental cavities or tooth decay and many of his teeth were missing.

His brain appears to have been 'about normal' for the modern Mexican Indian. His intelligence is also said to have been about the same.

According to the sutures of the skull. Tepexpan was in his forties when he met death. It is assumed that he met an unhappy end, since his remains were found face down on what was once the edge of a lake. He may have been killed, but there is nothing now to account for his death.

As for Tepexpan's missing backbone, ribs, shoulder blades and pelvis, they evidently were either destroyed by animals or disintegrated through the years.

### SKIN 'BANKS' SIMPLIFY GRAFTING TECHNIQUE .

DEVELOPMENT OF PLASTIC SURGERY IN BRITAIN
By JOSEPH KALMER

(Reprinted from Release No. BF. 141, issued by British Information Services, New Delhi)

PLASTIC SUBGERY has been practised for many years now, and during World War II decisive progress was made in this important sphere. While skin grafting, skin removal and similar operations, coming within the sphere of surgery, were formerly for the purpose of beautifying the human body, a new field confronted plastic surgeons in World War II.

This consisted of work of much greater significance from the health and social points of view, for example, the treatment, not of individual cases, but of thousands of patients suffering from burns or wounds caused by bombs or artillery missiles. Some of the airmen taken from crashed planes were so terribly burned that any hope of restoring them to health would have been impossible without the use of plastic surgery. Without it they would have gone through life as helpless cripples.

#### PERFECTING OLD METHODS:

Britain, whose Royal Air Force fought on all fronts during the war, had special hospitals or hospital departments, where doctors were given the opportunity of perfecting the former methods used in skin grafting. The original method was to take a piece of skin from the thigh or arm of the patient and graft it on to the wound. It was soon found, however, that such fresh skin grafts were not always advisable owing to the presence of bacterial flora, or some other reason.

Preserved skin was, therefore, used in such cases and according to the report published in the London medical journal, The Lancet, by Dr. Adrian E. Flatt of a Ministry of Pensions Hospital, the main problem as regards skin used for grafting was the question of storage. The customary methods were complicated because of the changes in temperature occurring in automatic refrigerators, that is, those operated by electricity or gas. It was then discovered that the

· most constant-temperature was to be found in the dish used to catch the condensed moisture falling on the cooling coil.

The old method of packing skin for storage in Pliofilm sheets and two sterilized cloths was found to be impracticable. Dr. Flatt's new method consists in rolling the skin on paraffin-soaked tulle grass, which is then placed in screw-topped, glass, pathological specimen bottles.

#### BEDSIDE OPERATION

In all 17 patients involving 50 graftings have been treated with preserved skin. The youngest of the patients, most of whom were of the male sex, was only two years old and the oldest 67. The wounds treated originated from thermal, electric or x-ray burns, traumatic, full-thickness skin loss or varicose ulcers. All these grafts were made at the bedside of the patient, and not on the operating table.

The usual sterilizing measures were taken. The wound was washed out with a bacteriological swab and dusted with penicillin-sulphathiazole powder before the graft was placed in position; the wound was then dressed with a saline-gauze, cotton-wool pressure dressing. This dressing was not changed for at least 48 hours, and was usually left untouched for four days.

48 hours, and was usually left untouched for four days. Skin which has been stored for about three weeks is normally used, but skin which had been stored for 68 days was found to be unchanged and could have been used without difficulty. The thinner the grafted skin, the quicker it grew on to the wound; the skin was freshly vascularized from beneath.

The latest experiments made in Britain on the storage and use of skin have shown that, after about three weeks, the new skin graft grows on to the wound thus sparing the patient, in many cases, from further operations and, at the same time, reducing the length of his stay in hospital.

### Medical Councils

### FACULTY OF TROPICAL MEDICINE AND HYGIENE, BENGAL

The following students are declared to have passed the L.T.M. Examination held on the 28th September, 1948, and subsequent days:—

#### Passed with Distinction

Ram Prakash Khera, L.S.M.F. (Punjab), Private Practitioner.

Mattamana Mathew Varghese, L.c.P.S. (Bom.), Sub-Assistant Surgeon, B. B. & C. I. Railway Dispensary, Bandra, Bombay.

#### Passed

(Arranged in alphabetical order)

Ganesh Prasad Agarwal, I.M.P. (C.P.), Private Practitioner.

Bimal Kumar Banerjee, L.M.F. (Dacca), Private Practitioner.

Saroj Kumar-Banerjee, L.M.F. (Cal.), Private Practi-

tioner. Satvendra Nath Bhattacharjee, L.M.F. (Dacca), Private

Practitioner.
Sudhir Nath Bhattacherjec, L.M.F. (Cal.), Assistant Medical Officer, Deckiajuli Tea Estate, P. O. Deckiajuli, Assam.

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#### B. MUKHERJEE,

Honorary Secretary,
Faculty of Tropical Medicine and
Hygiene, Bengal.

#### UNITED PROVINCES MEDICAL COUNCIL 9TH DECEMBER, 1948

It is hereby notified for the information of all whom it may concern, that the name of the following medical practitioner has been erased from the United Provinces Medical Register by the order of the United Provinces Medical Council under section 26 of the United Provinces Medical Act, III of 1917:—

Dr. Harkishan Singh Ahlowalya, M.B., B.S. (Punjab, 1940), (son of Mr. Harnam Singh Ahlowalya), Nayaganj, Kanpur. Registered with the United Provinces Medical Council under certificate no. 4298, dated 12th February, 1941.

A. C. BANERJEA,
President, Medical Council, U.P.

## The Indian Medical Gazette Fifty Years Ago

#### MEDICAL REFERENCE LIBRARIES

(Reprinted from the *Indian Medical Gazette*, Vol. 33, December 1898, p. 463)

"In a paper read before the American Medical Editors' Association at the meeting held in Denver on June 6th, Dr. G. M. Gould outlined a plan which will commend itself to most of us—in fact, to all who feel an interest in the diffusion of medical knowledge. It is practically impossible for any individual to possess more than a mere fraction of what is continually being published, and the difficulty of the case is increased by the circumstance that communications of permanent value are unavoidably associated with much that is of

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merely passing interest. In this field of action, however, as in many others, a combination of workers can accomplish what it would be hopeless for an individual to attempt. Dr. Gould's proposal is that public medical libraries shall be founded in every large community, so that the local practitioners may have easy access to the best reference books and to current periodicals. Such libraries would have a most beneficial influence on the intellectual life of the profession, enabling practitioners who have rare or difficult cases to compare their observations with those published by their colleagues elsewhere, and encouraging them in their turn to give their results to the world for the information of others. Of course, libraries, like most human institutions, vary both in degree and in kind, but surely Dr. Gould fixes his standard of excellence very much too high when he asserts that there are not half-a-dozen good medical libraries in the United States, a country with 100,000 medical graduates and a population of 70,000,000. It is generally understood that there are in the States more than centres of medical education half-a-dozen possessing good libraries, whilst the vast collection in the Surgeon-General's library at Washington is a theme of admiration for booklovers everywhere. The first step realization of Dr. Gould's idea will be the formation of an exchange to receive medical books and periodicals from all sources by gift or purchase, and to distribute them to the members of the Association of Medical members Librarians. Dr. Gould has such confidence in the ultimate success of his project that he has offered in the meantime to superintend the for the executive committee of work Association '.

India is not the only country where the need of libraries of medical books is keenly felt as the following extract from the Lancet shows:—
'The resolutions recently passed at the Association of Medical Librarians approve of any ethical and legitimate methods of encouraging the organization, perfection and support of public medical libraries in all the cities, towns and villages (sic!) of the United States, and earnestly urges the members of the Association to aid in the formation and organization of such libraries'.

### Current Topics, Etc.

#### Properties of Antibiotic Agents (other than Penicillin and Streptomycin)

(Abstracted from the South African Medical Journal, Vol. 21, 8th November, 1947, p. 832)

WITHIN recent years the term antibiotics has been employed for designating substances produced by or derived from living cells destructive for other living

cells. In a strict sense, therefore, all antimicrobial agents derived from living plant and animal cells are antibiotics. From this standpoint antibiotics may be defined as 'antimicrobial agents produced by living cells', although the term is now used in a more restricted sense to mean 'antimicrobial agents produced by living bacteria, yeasts, moulds and other plants'.

#### Tyrothricin-from Bacillus brevis

For almost fifty years it has been known that typhoid and diphtheria bacilli, staphylococci, etc., rapidly disappear when added to soil. Dubos discovered in 1939 in the soil the Bacillus brevis, the antibiotic agent of which was highly bactericidal for Gram-positive microorganisms but less effective against Gram-negative bacteria. This antibiotic agent was called Gramicidin. This agent contains a second substance possessing some degree of activity against Gram-negative microorganisms which is known as Tyrocidine. The mixture of these two substances obtained by autolysis of cultures of B. brevis was designated by Dubos as Tyrothricin.

of these two substances obtained by autolysis of cultures of B. brevis was designated by Dubos as Tyrothriein. Tyrothriein, therefore, is a mixture of gramicidin and tyrocidine. Gramicidin is 25 to 50 times more active against Gram-positive micro-organisms in vitro than tyrocidine. It is particularly active against streptococci, various types of pneumococci, most strains of staphylococci, diphtheria bacilli and amerobic bacilli, but is inactive against the tubercle bacillus. Tyrocidine possesses some activity in vitro against such Gramnegative micro-organisms as N. catarrhalis, N. intracellularis (meningococcus), N. gonorrhæa, H. influenzæ.

Tyrothricin is so highly hemolytic in vitro for human erythrocytes, even in the presence of serum, plasma and tissue extracts, that it cannot safely be administered by parenteral injection. Gramicidin itself is much less toxic than tyrothricin. Under the circumstances tyrothricin is employed only by topical application in the treatment of localized infections. In concentrations of 0.1 to 0.5 mg. per c.c. it is well borne by the tissues, including mucous membranes. It is supplied for topical application as a concentrate in alcoholic solution requiring dilution with sterile, distilled water (not saline solution). The usual concentration for clinical use is 500 micrograms (0.5 mg.) per c.c., which is isotonic. If not used within twenty-four hours, suspensions should be discarded and fresh suspensions prepared.

prepared.

Topical applications of the compound, according to Kolmer, have proven valuable as supplementary measures to surgical procedures. Local instillations, irrigations and wet packs may be employed. Tyrothricin is available as a cream or ointment for the treatment of various pyodermatoses, chronic ulcers (varicose, decubital and ischemic), accessible post-surgical wounds and burns by topical applications. Tyrothricin, in the form of drops, irrigations or saturated gauze packs, has proven effective in the pre- and post-operative treatment of sinusitis, mastoiditis and otitis media due to streptococcal, pneumococcal and staphylococcal infections. Streptococcal and pneumococcal empyemas have been successfully treated with irrigations. Tyrothricin has been used in eye infections as well as in the treatment of furuncles and carbuncles. Irrigations in gonorrhea were no better than those observed with irrigations of solutions of potassium permanganate.

#### SOVIET GRAMICIDIN

Gramicidin S or 'Soviet gramicidin' has been discovered by Gause and Brazhnikova in a bacillus of the B. brevis type, isolated from garden soil. The substance is somewhat more bactericidal for staphylococci than tyrothricin although less so for streptococci and pneumococci. But while tyrothricin is relatively inactive against Gram-negative bacilli in vitro, gramicidin S has been found active against Esch. coli, Proteus vulgaris, V. choleræ, Shig. dysenteriæ and the Salmonella.

Gramicidin S is distributed in ampoules containing 4 per cent alcoholic solution of the dry substance. It

is diluted 100 times with water, so that each c.c. of solution contains 400 micrograms. It is also employed in an ointment. Successful results have been reported in the treatment of gunshot wounds, suppurative burns, phlegmonous infections, empyema, osteomyelitis and otitis media by daily applications or instillations of solutions containing 400 to 800 micrograms per c.o. According to data now available, gramicidin S does not appear to be any more effective therapeutically than penicillin although it possesses the advantage of greater stability; probably it is not any more effective than tyrothricin.

#### STREPTOTHRICIN

Streptothricin, discovered by Waksman and Woodruff in 1942, is an antibiotic produced by Actinomyces lavendulæ, which belongs to the group of chromogenic actinomyces. Like streptomycin, it is highly active against Gram-negative bacilli. It is highly probable that its pharmacological activities, which have not been tested so far, are closely similar to those of streptomycin, but streptothricin is much more toxic for mice. For this reason it has not been administered to human beings. It may prove useful, Kolmer says, in the treatment of infected wounds, burns and other local infections by the topical application of solutions containing no more than 1 mg. per c.c.

Clavacin is an antibiotic substance produced in culture of Aspergillus clavatus. It is highly bactericidal for various Gram-positive and Gram-negative organisms in vitro. It is toxic for leucocytes in amounts smaller than required for bacteriostatic effects.

#### OTHER SUBSTANCES FROM PENICILLIUM

In 1942 Kocholaty observed that a second anti-bacterial substance was produced by Penicillium notatum. He named the substance Penatin; it is strongly bactericidal and bacteriostatic against Grampositive bacteria, but, unlike penicillin, is also active against many Gram-negative micro-organisms. Its activity is dependent upon the presence of glucose. Couthard and his colleagues found a second antibacterial substance present in filtrates of cultures of Penicillium notatum which they called Notatin. Roberts also isolated a substance distinct from penicillin which they called Penicillin B. These three substances have many similarities which emphasize the probability that they are identical.

Penicillic acid is a substance produced in cultures of Penicillium puberulum, Penicillium cyclopium and other species of Penicillia. Penicillic acid, which is a hydroxylactone, appears to possess considerable activity not only against Grammembers of the group of Gram-negative bacilli. Its possible therapeutic value has not yet been determined.

Penicidin is an antibiotic substance produced by various species of Penicillia. It is active against both Gram-positive and negative organisms including Eber. typhosa. In contradistinction to penicillin it is relatively heat-resistant, and not readily destroyed by hydrochloric and sulphuric acids.

#### CHLOROPHYLL

Chlorophyll is obtained from fresh or dried leaves by extraction with acetone. It occurs in colloidal form in greatest concentration in nettles, alfalfa and spinach. Chlorophyll by parenteral and oral administration is practically non-toxic for the lower animals. As much as 500 c.c. of 0.5 per cent solutions have been administered to human beings by intravenous injection at daily intervals without toxic effects. Solutions and ointments of chlorophyll are well borne by wounds and mucous membranes with no local irritation. Its bactericidal activity is low. Still it has been found effective by topical application for localized infections. Kolmer believes that its therapeutic properties are due to the creation of an unfavourable environment for bacterial growth rather than to any direct action upon bacteria.

Topical applications of chlorophyll are of value in the treatment of infected wounds, indolent ulcers, bedsores, compound fractures, burns, amputation stumps, osteomyelitis, sinus tracts, etc.

Actinomycin is an antibiotic substance produced in cultures of Actinomyces antibioticus. It is exceedingly toxic for lower animals, and has not been employed for human beings. Citrinin is an antibiotic agent produced in cultures of Penicillium citrinum and Aspergillus candidus. In view of its high toxicity, it has not been employed by parenteral administration for human beings. Gliotoxin, produced in cultures of Aspergillus fumigatus and other fungi, is highly toxic as well. Other antibiotic agents produced in cultures of Aspergillus fumigatus are Fumigacin and Fumigatin. In large doses fumigacin has shown some therapeutic activity in the treatment of experimental streptococcal infections of mice but has not been employed in the treatment of human beings.

#### ASPERGILLIC ACID

Aspergillic acid, produced by Aspergillus flavus, is active against Myco. tuberculosis in vitro, probably because of interference with the utilization of iron by this organism. Bacitracin is produced by a strain of B. subtilis. It is active against hæmolytic streptococci, streptococci, pneumococci, etc. It seems that it has a range of antibacterial activity similar to that of penicillin. Subtilin may be identical with bacitracin. Other antibiotics mentioned by Kolmer are Chlorellin, Allicin and Canavalin. The latter, an antibiotic substance extracted from soya bean flour, has been administered intravenously in the treatment of 13 cases of pneumonia, complicated by empyema and septicæmia, with alleged therapeutic effects.

The following six items are reproduced from Medical Newsletter No. Wa-7, dated August 1948, prepared by the American Medical Association.

#### Roentgenologic Treatment of Lymph Nodes and Spleen in Brill-Symmers' Disease

Rubenfeld points out the pathology, clinical features and treatment of giant follicular lymphadenopathy of Brill-Symmers' discase, briefly reviewing 19 observed cases. He states that this comparatively newly described disease is widely recognized by pathologists but is frequently mistaken by clinicians to be Hodgkin's disease.

While both diseases are diseases of the lymphoid system and both characterized by localized enlargement of the superficial lymph nodes, giant follicular lympha-characterized specifically by numerical hyperplasia of the lymph follicles which may consist exclusively of small lymphocytes.

hyperplasia of the lymph foliates which may consist exclusively of small lymphocytes. Three types of cells are commonly distinguishable in the follicles: large cells which hypochromatic nuclei whose borders are sharply defined and indented; slightly smaller cells with richly chromatic nuclei but with similarly indented limiting membranes, and cells with still smaller, deeply staining nuclei with poorly defined limiting membranes that are of the type of large lymphocytes.

Brill-Symmers' disease is a pattern of hyperplasia with potentialities for multiple differentiation which may be unrecognizable in the original morphology. Or it may remain unchanged throughout life. It may undergo transformation into lymphosarcoma or it may terminate in lymphoid leukemia or become associated with the histologic changes of Hodgkin's disease. It may give rise to a reticulum cell sarcoma or, finally, it may undergo transformation into the polymorphous cell. sarcoma of Symmers.

Of the 19 cases reported here, nine patients with giant follicular lymphadenopathy and 10 with polymorphous cell sarcoma, all received radiation therapy.

The lymph nodes and spleen were treated with roentgen rays of a half value layer of 1 to 2 mm. of copper at a distance of 50 cm. in unit doses that varied between 100 and 200 r in air. The patients ranged in age from 12 to 59. The author states in summary that roentgen therapy of 200 kilovolt potential was used to treat the lymph nodes and spleen. Two noteworthy variations in response were noted: the nodes in giant follicular lymphadenopathy receded or disappeared under doses of 800 to 1,000 r, while the nodes in polymorphous cell sarcoma regressed only after doses of 2,000 to 3,000 r.

The nodes in polymorphous cell sarcoma frequently showed a latent period of reaction in contrast to the rapid disappearance of the nodes in giant follicular lymphadenopathy. These variations may be used as a therapeutic test. Sixty-six per cent of patients with giant follicular lymphadenopathy and 60 per cent of those with polymorphous cell sarcoma are apparently well five or more years after the institution of treatment.

(Rubenfeld, Sidney, New York, Journal A. M. A., 137, 849-853, July 1918.)

#### Streptomycin Therapy of Tuberculosis

Farmer and Eagle present a review of some pertinent aspects of the pharmacology and clinical use of streptomycin in the treatment of tuberculosis and also a review of the current medical literature on the subject. Streptomycin was originally discovered in 1944 by Schartz, Bugic and Waksman and was demonstrated to inhibit the growth of tubercle bacilli in vitro. It was then shown to have an inhibitory influence on tuberculous infection in guinea-pigs by Feldman, Hinshaw and Mann and in mice by Youmans and McCarter.

The first cases in which tuberculosis in human beings was treated with streptomycin were reported by Hinshaw and Feldman in 1945 and by November 1946 they had treated 100 patients. Concerning absorption of streptomycin, the authors state that parenteral injection is the usual method of administration, the intramuscular route being the most common. Fifteen minutes after a single intravenous injection of 600 mg, the concentration in the blood is from 30 to 35 micrograms per cubic centimetre. The concentration decreases over a period of six hours to about 5 micrograms per cubic centimetre. Oral administration of 1 gm. daily does not produce significant concentrations in the blood, due to poor absorption. When streptomically there is good retentile cerebrospinal fluid.

by nebulization in daily doses of 500 mg. does not result in significant concentration in the blood.

The distribution of streptomycin in the tissues and organs of the body has not been fully investigated. Post-mortem examinations show that the drug was abundant in the blood serum, kidney and gall-bladder and negligible in the liver and spleen. Streptomycin is transmitted through the placenta into the fetal blood, making the fetus vulnerable to toxicity. The major part of the excretion of streptomycin is through the kidneys, from which two-thirds of the drug administered may be recovered in 24 hours. Renal toxicity may occur in the form of reduced renal function, particularly in patients who had renal disease prior to streptomycin therapy.

In almost all patients receiving streptomycin in prolonged courses and in large doses, damage to vestibular function will develop. This reaction is presumably irreversible. Nerve deafness, partially reversible, is an uncommon occurrence in streptomycin therapy. While auditory loss may be prevented if the drug is discontinued when timitus begins, failure to discontinue the drug may result in complete deafness. Five cases of leukopenia with netropenia and three cases of agranulocytosis have been reported as occurring in association with streptomycin therapy.

The authors state that on the basis of reports in the medical literature there appear to be indications for streptomycin therapy in the following conditions: laryngeal and endobronchial tuberculosis, military tuberculosis, tuberculous meningitis, osseous tuberculosis, tuberculous lymphadenitis, sinuses and fistulæ, and exudative tuberculous pulmonary lesions not responsive to conservative therapy. In genito-urinary tuberculosis and tuberculous enteritis, streptomycin may have a place in treatment as a palliative medication. The authors state in summary that it is desirable for the present time to limit the use of streptomycin to these types of tuberculosis for the following reasons:

First, streptomycin is a definitely toxic drug. When the disease process is severe, the prognosis grave, and use of streptomycin indicated, the toxicity hazard is not comparatively great, but when the disease process can be controlled by other measures or when streptomycin has shown little promise in similar cases, the toxicity hazard cannot be taken lightly. Secondly, after a prolonged course of treatment with streptomycin, strains of tubercle bacilli frequently appear which are resistant to streptomycin. This resistance is prolonged and a return of sensitivity has not been reported. Therefore, after one course of streptomycin therapy the drug may become and remain totally ineffective and hence may be useless at a later date when the indication for its use is more urgent. It is added that the actual killing of tubercle bacilli and healing of lesions must be accomplished by the immune mechanisms of the body and therefore streptomycin is to be considered merely an adjunct to the treatment of tuberculosis and the patient given all the supportive measures of modern tuberculosis therapy.

(Farber, Seymour M., San Francisco, Calif., and Eagle, Henry, California Medicine, 69, 6-11, July 1948.)

#### Effect of Dicumarol on the Heart in Experimental Acute Coronary Occlusion

BLUMGART ct al. use the experimental method in attempting to learn whether adverse myocardial changes might result from use of Dicumarol to prevent thromboembolic phenomena. Dogs were used advantageously from the point of view of choosing the site of occlusion, making the mechanism and rate of occlusion more uniform, and the possibility of accurately studying the myocardium by sacrificing the animal and examining the heart at stated intervals following occlusion and administration of anticoagulants. The experimental investigations of the authors are summarized as follows:

- 1. In 31 dogs, the left anterior descending coronary artery or a major branch was ligated. The effect of the oral administration of Dicumarol on the myocardium and coronary arteries was studied in 14 animals. In three dogs, heparin was administered several hours post-operatively until the effect of Dicumarol was apparent. Fifteen dogs served as a control group.
- 2. The incidence and magnitude of hæmorrhagic extravasations on the endocardium and pericardium were the same in the treated and untreated groups.
- 3. The incidence and magnitude of miliary hæmorrhages on microscopic examination of the heart muscle were similar in the dicumarolized and control animals.
- 4. In a small group of dogs in which sufficient Dicumarol was administered to elevate the prothrombin time to levels as high as 132 seconds, no increase in the hæmorrhagic phenomena was observed in the myocardium.
- 5. The size of the infarcts in the Dicumarol-treated and untreated animals showed no significant differences. The size of the infarcts was that which could be anticipated on the basis of the artery occluded.

- 6. There were no apparent differences in the healing or reparative processes in the hearts of the Dicumarol-treated and the control animals.
- 7. Thrombotic occlusions of the smaller arteries were found within the infarcted area in dogs receiving Dicumarol approximately as often as in the untreated group. No thrombi were found in the region of the tie below the point of occlusion. In one instance, an untreated animal, a thrombus was found in the region of the tie above the point of occlusion.
- 8. No mural thrombi were found in the auricles or ventricles in the treated or in the untreated animals.
- 9. The development of collateral anastomotic channels between the coronary arteries was the same in both groups. On or about the fourth day, unmistakable evidences of collateral vessels between the left anterior descending branch distal to the tie and the circumflex branch of the left coronary artery were observed. On and after the sixth day of survival, the the magnitude of these anastomotic vessels was markedly increased.

The authors conclude that the results of this investigation reveal that Dicumarol produces no adverse effects on the myocardium of dogs which retard the healing process or the development of collateral circulation in experimentally produced myocardial infarction.

(Blumgart, H. L., Cambridge, Mass.; Freedberg, A. S.; Zoll, P. M.; Lewis, H. B., and Wessler, S., American Heart Journal, 36, 13-27, July 1948.)

#### The Vaginal Smear

FREMONT-SMITH AND GRAHAM screened 200 unselected office patients for uterine cancer by examination of the vaginal smear. They state that the vaginal smear has proved of unique value in the detection of carcinoma of the cervix in the early non-invasive stage. Of the 200 patients, 21 presented gynæcologic symptoms; only 14 complained of abnormal bleeding or discharge. The age span of the group was 18 to 81 years, with an average of 42 years. Of the 200 smears 183 were negative for cancer, seven were doubtful; five were unsatisfactory, and five were positive for cancer. Of the five women whose smears were positive, cancer was present in four (carcinoma in situ of the cervix in three; adenocarcinoma of the endometrium in one).

A positive diagnosis of cancer from histologic sections of the cervix of the fifth woman whose smear was positive was not made. Of the seven women whose smears were doubtful, one was found to have carcinoma of the bladder, for two repeated smears were negative, and on four no follow-up observation was possible. Of the three women found to have cervical cancer, two had had no bleeding or discharge; the third had bled for a single day after estrogen therapy given for arthritis, which had been her presenting symptom.

In all, pelvic examination revealed nothing abnormal and the authors point out that the patient harbouring adenocarcinoma of the endometrium came to the physician with the sole complaint of pain in the head. The authors observe that cervical carcinoma exists for months or years before any symptom or sign is apparent and early cases will not often be discovered by the gynæcologist but must be discovered by the internist by means of vaginal smear of all suspected cases. It is added that all patients with a positive smear deserve immediate and multiple biopsies, since the authors believe that a final diagnosis of cancer can be accepted only after study of fixed tissue sections.

In the authors' experience, both a positive smear with a negative biopsy and the converse, a negative smear with a positive biopsy, has been observed. However, early carcinoma of the cervix is frequently discovered in tissue sections made after hysterectomy when multiple pre-operative biopsies failed to demonstrate

its presence. In this series of 200 unselected office patients unsuspected cancer of the uterus was diagnosed in 2 per cent of the cases by use of the vaginal smear as a screening procedure.

(Fremont-Smith, Maurice, Boston, Mass., and Graham, Ruth M., Journal A. M. A., 137, 921-922, 10th July, 1948.)

#### Microwave Radiations: Heating of Human and Animal Tissues by Means of High Frequency Current with Wavelength of 12 Centimetres

Osborne and Frederick carried out a series of experiments to determine whether a high frequency of 2,400 to 2,500 megacycles, or a wavelength of approximately 12 cm. with a maximum power output of 125 watts, would heat living tissues to a temperature of 104°F. at a depth of two inches and also whether the heat gradient as the result of treatment was normal, that is, a decreasing temperature from superficial to the deeper underlying tissues or whether there was a reversal of this normal heat gradient. A Raytheon microtherm was used to make these studies.

The experimenters subjected to the high frequency the thighs of dogs, the eyes of dogs, the frontal sinus of the dogs, and the thighs of human subjects. The authors state in summary that in the thighs of dogs, following exposure to high frequency energy, the maximum temperature was observed in the subcutaneous level and decreasing temperatures were found with increasing depth. The average temperature at a depth of two inches in 10 experiments using the 6-inch hemispherical director at a spacing of one inch from the skin surface was 104.1°F. In the experiment on the eyes of dogs, it was found that the average temperature of the vitreous body following microwave treatment was 105.8°F.

One animal received a series of six treatments over a period of three weeks. There was no evidence of damage to the eyes or contiguous tissues. In the six experiments in which the frontal sinus of the dog was exposed to microwave radiations, the average of the temperatures of the frontal sinus following exposure was 105.1°F.

In the 24 experiments in which the thighs of human subjects were exposed to microwave radiation, the average temperature at a depth of approximately two inches immediately following microwave irradiation was 104.2°F. One small superficial blister was produced. By the tenth day the blister had disappeared. The treatments were comfortable to the patients, and a minimum of erythema was noted. Microwave treatment, according to the authors, should be applied cautiously because the minimum of erythema and discomfort to the patient gives the operator less warning of overheating. It is pointed out in conclusion that a disadvantage of this new method of tissue heating is its definite localization.

In all the experiments reviewed here the body temperature underwent little change. Diathermy presumably is more effective when large areas, such as an entire limb, are heated rather than a definite localized area. By the large area technique the circulation of an entire limb can be influenced and, if dosage of radiation is low, an active hyperæmia is secured and passive congestion avoided. At present it is not possible to heat large areas of the body with the microtherm because of the limited size and shape of the directors in use.

(Osborne, Stafford L., Northwestern University Medical School, Chicago, Ill., and Frederick, Jesse N., Journal A. M. A., 137, 10-36-1040, 17th July, 1948.)

#### Treatment of Angina Pectoris with Propylthiouracil

THE cases of angina pectoris treated with propylthiouracil as a substitution for thyroidectomy are reported by Hollander and Mandelbaum. The authors state that in the small number of cases reported to date of angina pectoris treated with propylthiouracil the results have varied and these 10 cases are added for the purpose of making possible better selection of cases which may respond to thiouracil therapy. Ten hypertensive patients with a definite anginal syndrome were chosen. Typical precordial or substernal pain, usually related to exertion, had been present from five months to seven years. Only those patients who had been followed for many years in the clinic or hospital were included, so that the effect of the drug could be carefully evaluated.

All patients had been previously treated with various medications, including placebos, without success. With the exception of thiocyanate therapy in some cases, and nitroglycerine when required, no medication other than propylthiouracil was given during the study. Four of the 10 patients showed definite symptomatic improvement. Two of the others, in one of which the basal metabolic rate fell to minus 27 per cent, became progressively worse. No correlation should be drawn between the improvement in symptoms and the level of the basal metabolic rate.

In three of the four patients who showed improvement, the basal metabolic rate was still within normal limits; all four patients had a fall in the basal metabolic rate of 11 to 20 points. As seen in the treatment of thyrotoxicosis, improvement in patients with angina pectoris took place within two to eight weeks of treatment. If at the end of this time, no improvement was shown, then neither further increase, nor continuation of the medication for as long as six months, was of any avail. Treatment with propylthiouracil in these 10 cases had no effect on either the blood pressure or on symptoms secondary to the hypertension. The electro-cardiograms were not appreciably changed. Effects on the blood cholesterol level were unpredictable and no persistent inverse relationship was found between a fall in the basal metabolic rate and a rise in the cholesterol level. Potassium thiocyanate had been given to six of these patients subsequent to the administration of propylthiouracil and continued in four of them at some time during the course of treatment with no effect on response to propylthiouracil.

Severe signs of thyroid deficiency developed in only one patient. These consisted of lethargy, weight gain, and puffiness of the legs and face. In six others, while the basal metabolic rate was not particularly low at the onset of therapy, when the level was decreased, water retention occurred. This caused dyspnea, drowsiness and ædema of the legs. Intermittent claudication which has been described in myxedema as due to diminution of the peripheral blood flow, occurred in one case.

The authors conclude that the ideal initial and maintenance dose of 6-propylthiouracil for the treatment of angina pectoris remains to be determined. If after adequate treatment for a two-month period, there is no symptomatic improvement, further administration is probably useless. Since 6-propylthiouracil is relatively non-toxic and has shown benefit in some cases of angina pectoris, a further trial of its use is warranted.

(Hollander, George, Philadelphia, Penna., and Mandelbaum, Harry, Annals of Internal Medicine, 28, 1150-1156, June 1948.)

#### Sidelights on Malaria in Man obtained by Subinoculation Experiments

By N. H. FAIRLEY et al.

(Abstracted from the Transactions of the Royal Society of Tropical Medicine and Hygiene, Vol. 40, May 1947, p. 621)

In this paper the value of subinoculation in the study of human malaria has been extended and a new technique developed consisting of the transfusion of larger quantities of blood (200 c.c.) by the Julian Smith direct transfusion apparatus from the malaria-infected donor into the non-immune recipient. Special attention has been directed to determine the distribution of plasmodia in the blood at different periods after inoculation of sporozoites by infective mosquitoes, the action of anti-malaria drugs on different stages of the life cycle of malaria parasites, and indirect evidence regarding the

existence of an exo-erythrocytic cycle in man.

1. Four out of the following six phases in the life history of malaria parasites in man have been demarcated by subinoculation during the investigations.

(a) The initial invasion stage when viable sporozoites

may be demonstrated in the circulating blood for short periods (\frac{1}{2} to 1 hour) after inoculation of sporozoites by anopheline mosquitoes into the tissues or directly into the blood vessels.

(b) The negative blood phase or pre-patent period when pre-crythrocytic or early exo-crythrocytic forms are presumably undergoing schizogony in reticulo-endothelial cells; this lasts approximately 6 days in P. falciparum and 8 days in P. vivax during which time massive subinoculations of blood from heavily infected volunteers uniformly fail to induce malaria in recipients.

(c) The initial stage of parasitemia which is generally of submicroscopic density. Here there is an invasion of of submicroscopic density. Here there is an invasion of the blood by first generation merozoites (micromerozoites of Reichnow and Mudrow) presumably liberated from the pre-erythrocytic or early exocrythrocytic forms. This occurs on the 7th day (144 + hours) in P. falciparum and on the 9th day (192 + hours) in P. vivax. The first generation of crythrocytic parasites are usually of submicroscopic density, being rarely revealed even after prolonged examination of thick blood films. Their presence is shown by positive subinoculations and it is generally about 3 days before parasites are demonstrated microscopically. This stage may be manifest clinically by minor premonitory clinical features such as strated microscopically. This stage may be manifest clinically by minor premonitory clinical features such as headache, backache, generalized muscular pains and tenderness over the liver. Hæmatologically, there is a characteristic left polymorphonuclear shift, a relative leucopænia and a decrease in lymphocytes.

(d) Overt malaria, associated with primary fever, major clinical features and demonstrable parasites in blood films. In falciparum malaria parasites are first demonstrable in thick films (1 per c.mm.) on an average demonstrable in thick mans (1 per c.mm.) on an average of 9.5 days after a single exposure (range 7 to 12 days). Trophozoite densities increase in phase rapidly, there being a big rise cach 48 hours followed by a smaller fall. In untreated heavy infections clinical evidence of hyperinfection is manifest about the 17th to 18th of hyperinfection is manifest about the 17th to 18th day; unless treatment is commenced not later than the 19th day acute pernicious malaria with or without cerebral symptoms may develop. Death is liable to ensue from the 21st day onwards by which time 20 per cent or more of the corpuscles may be infected.

In vivax malaria parasites are first demonstrated microscopically in thick films about 12 days after exposure (range 10 to 17 days). Trophozoite densities only gradually increase the curve being sigmoid in form.

only gradually increase the curve being sigmoid in form. Only gradually increase the curve being sigmoid in form. The mean density in untreated cases was 8,270 per c.mm. by the 19th to 20th day when the patient was generally sufficiently ill to call for treatment. In a healthy volunteer where the vivax infection was allowed to run its natural course without treatment arises. to run its natural course without treatment primary fever of intermittent type continued for several weeks until the development of premunity led to the spontaneous remission of the primary fever.

(e) A latent phase in which clinical features disappear and parasites are no longer demonstrable microscopically. Here subinoculation has proved of very real value as it indicates a fundamental difference in parasite behaviour between falciparum recrudescences and vivax recrudescences and relapses. In uncured malignant tertian malaria examined in the quiescent phase subinoculations are positive even though it may be impossible to demonstrate parasites in blood films for the time being. In these falciparum infections a negative subinoculation indicates radical cure, for once the blood is completely cleared of parasites, in our experience

recrudescences do not subsequently occur.

Latent benign tertian malaria is a different story.

Parasites may not be demonstrable microscopically and subinoculations may be repeatedly negative, yet frank malaria attacks may occur later.

(f) Recrudescence and relapses characterized by overt

tertian malaria and readily demonstrable parasites in the blood film. James defined a recrudescence as a return of fever and parasites within 8 weeks of recovery from the primary attack, a relapse as a return between the 8th and 24th week and a recurrence as a return later than this.

Apart from the time factor, the essential difference between falciparum recrudescences and vivax recrudescences, relapses and recurrences, would appear to depend on the fact that in falciparum erecrudescences asexual parasites persist in the blood throughout the entire latent period, though for a time only in sub-microscopic densities, whereas in vivax recrudescences, relapses and recurrences, the blood is frequently cleared of parasites for considerable periods of time in the latent period. The reason for reappearance of parasites in the blood would appear to depend on the persistence of exo-erythrocytic forms in *P. vivax*, whereas in *P. falciparum* the exo-erythrocytic forms disappear permanently—presumably because they are entirely converted into first generation merozoites which escape into the circulating blood.

2. An atypical malarial syndrome unassociated with

demonstrable parasites in blood smears occurred in one recipient where vivax sporozoites were transfused and in another where falciparum sporozoites which were transfused. Overt attacks were absent but the symptoms included headache, malaise, anorexia, slight transient elevations of temperature (99°F. to 100°F.) splenomegaly, hepatomegaly (one case), left neutrophil shift and some fall in hæmoglobin and red blood cell counts. Though the blood was frequently and thoroughly searched for parasites they were never demonstrable microscopically. Subinoculations performed on the 53rd day following foliancing infection formed on the 53rd day following falciparum infection and the 67th day following the vivax infection were negative; they were not done earlier and for this reason the presence of parasites in submicroscopic densities in the early phases of infection cannot be excluded in either instance with certainty. In addition to the small number of sporozoites injected the hypothesis suggested to explain the syndrome is that the sporozoites become modified in some manner by transfusion so that either exo-erythrocytic schizogony did not proceed beyond the macroschizont and macromerozoite stages described by Reichnow and Mudrow in P. præcox, or, if it did, so few micromerozoites were produced or they were so devitalized that they never their and they have a so devitalized that they never their sections of the section of attained a density which was demonstrable microscopically. Under the latter circumstances successive invasion of endothelial cells might be maintained but not successive invasion of red corpuscles with establishment of the asexual erythrocytic cycle and overt attacks.

3. Subinoculation experiments in experimentally infected volunteers taking adequate daily doses of antimalaria drugs and failing to develop overt malaria, have afforded most valuable information regarding the mode of action of these drugs as suppressants or causal

prophylactics.

Negative subinoculations.—Under such circumstances in P. falciparum infection a negative subinoculation on the 7th day indicates that the drug is acting as a complete causal prophylactic. Paludrine and plasmo-

quine both fall into this category. Since subinoculaquine both fall into this category. Since subinoculations remain constantly negative, and overt attacks do not occur, it is evident that viable parasites never gain access to the blood. In *P. vivax* infection a negative subinoculation on the 9th day indicates that the drug has either destroyed the sporozoite or the early exocrythrocytic forms or temporarily inhibited their development, i.e. the drug is a complete or partial causal prophylactic. Paludrine and plasmoquine both proved to be partial causal prophylactics since, despite negative subinoculations, the donors finally developed frank clinical malaria with parasites (*P. vivax*) in the blood smears.

Positive subinoculations .- A positive subinoculation on the 7th day in P. falciparum infection and on the 9th day in P. vivax infection indicates that the drug is neither a complete nor a partial causal prophylactic, and if the experimentally infected volunteer subsequently fails to get an overt attack while taking the drug, it implies that the drug is suppressing malaria by

schizonticidal action.

When schizonticidal drugs of atebrin type are given in adequate dosage each day for suppressive purposes positive subinoculations are obtained with 200 c.c. blood on the 7th day in P. falciparum and on the 9th day in P. vivax with remarkable constancy, just as if no anti-malarial drug was administered. Despite the fact that parasites are not being found in blood smears they may be demonstrable by subinoculation for the next 3 to 5 days but not subsequently. While a negative subinoculation from the 13th day onwards indicates radical cure in P. falciparum malaria, it generally only indicates suppression in P. vivax infections. The daily dosage of the schizonticidal drugs so tested were atebrin (0.1 gramme), sontochin (0.1 gramme), resochin (0.1 gramme), quinine (20 grains), sulphadiazine (1.0 gramme). Sulphadiazine proved an effective suppressant and radically cured *P. falciparum* infections, but failed to suppress most *P. vivax* infections. The others suppressed B.T. and suppressed and cured M.T. infections.

4. No significant difference in the suppressive and curative value of atebrin was noted in sporozoite-induced or trophozoite-induced falciparum malaria. Absence of overt attacks, late negative subinoculations and absence of premunity as judged by susceptibility to re-infection characterized both groups of experimentally infected volunteers indicating that radical cure had been achieved. Since data on subinoculation indicate that in falciparum malaria once parasites are completely eradicated from the blood the infection is radically cured, and as radical cure in sporozoite-induced radically cured, and as radical cure in sporozoite-induced and trophozoite-induced falciparum malaria are equally readily attained, it would appear that exo-crythrocytic forms of *P. falciparum* do not persist beyond the pre-crythrocytic stage—presumably because they are completely converted into first generation merozoites (micromerozoites). There is no evidence in man that late exo-crythrocytic forms are produced from asexual forms.

very remarkable difference was found in response to treatment with atebrin between sporozoitetransmitted and trophozoite-transmitted vivax malaria. While trophozoite-induced malaria was radically cured by atebrin in a suppressive dosage (9 out of 9) or therapeutic dosage (88 out of 90), radical cure in sporozoite-transmitted vivax malaria was difficult to sporozoite-transmitted vivax maiarin was difficult to attain. Not more than 3 per cent of volunteers on suppressive atebrin and not more than 18 per cent receiving one course of Q.A.P. treatment for vivax malaria were radically cured. The facility with which the parasites are permanently eradicated from the blood in trophozoite-transmitted vivax malaria and the blook fragueous of relayers in treated expressible induced high frequency of relapse in treated sporozoite-induced infections support the view that the different therapeutic response is due to the persistence of late exocrythrocytic forms which are more resistant to treatment and which after a registed paried liberate into the and which after a variable period liberate into the blood stream parasites (micromerozoites) giving rise to vivax recrudescences, relapses and recurrences. There is no evidence that asexual parasites give rise to late exo-erythrocytic forms in vivax infections.

## Vitamin Therapy-its uses and limitations

### ACUTE INFECTIONS

A multiple vitamin supplement is a useful basal treatment in febrile conditions for the requirements of the water soluble factors are increased at a time when the diet is usually restricted.

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For supplying the increased needs of vitamins A, B₁, and C, together with other important nutritional factors, Complevite is recommended for routine use.

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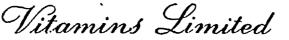
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Upper Mall, London, W.6, England.





Fig. 1

#### Case History.

(4. J., aged 45, Grocery Assistant. The patient first attended the clinic with

a deep punched-out ulcer above the left internal malleolus . . . surrounding skin inflamed (Fig. 1).

Treatment. August 16th, 1946. Sulphanilamide Powder was dusted into the ulcer, and calamine lotion applied to the inflamed area. An adhesive felt pressure pad was placed over the ulcer only, with a strip of 'Ichthopaste' to cover the ulcer and the inflamed area. 'Elasto-



### Healed with Standard Bandaging Technique



Fig. 2

plast' stirrups were applied and bandaging completed from toes upwards (Fig. 2).

September 27th, 1946. The ulcer and the devitalised skin area completely healed (Fig. 3). The patient was instructed to apply calamine lotion, pad of cotton-wool over the ulcer site, and to continue support with 'Elastocrepe' for a few weeks.

Details and illustrations above are of an actual case. T. J. Smith & Nephew, Ltd., or Hull,

ENGLAND. Manufacturers of 'Elastoplast', 'Elastocrepe' and 'Ichthopaste'. are privileged to publish this instance, typical of many in which their products have been used with success, in the belief that such authentic records will be of general interest,



Fig. 3



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parasitic drugs of this type exerted a toxicity upon the host only slightly less than the toxicity upon the parasite.

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#### The Treatment of Burns

(Abstracted from a letter dated 10th December, 1946, from Dr. G. P. Arnold to the Editor, The Medical Journal of Australia, published in the Medical Journal of Australia, 28th December, 1916, p. 918)

The author recommends egg albumin for all types of burns and in all positions.

The history is, that a small boy was sent in to him from the outlying farm districts with second degree burns of the face. He had been annointed by his grandmother with white of egg which was powdered with cornflour. As he seemed comfortable he did not interfere with his lesion in any way and in ten days the boy returned home completely healed and without any sears.

For this the author received great credit, and therefore felt that the treatment at least merited another trial. In any case of burns he anæsthetizes with 'Evipan Sodium' or ether, cleanses the area of all foreign substances, or loose skin or blisters with wool swabs saturated with ether and applies a single layer of gauze which has been drawn through egg albumen, flattening the gauze out gradually so that no air bubbles are present. This is allowed to dry, and the process is sometimes assisted by artificial heat.

If the original dressing adheres, as it usually does, it is left until it spontaneously peels off, all loose pieces being snipped away with sharp scissors and no further dressings applied. Any moisture appearing through the dressing is powdered twice daily with oleate of zinc and no attempt is made to evacuate any exudate which may collect beneath the gauze.

Of late he has been dusting the raw burnt surfaces with penicillin and sulphanilamide before application of the albumen, but does not consider this to be necessary, as it is only a balm to his conscience and not to the patient. He has no complaints made to him of pain and very seldom had he had to use a sedative.

In twenty-five years he has not had to use a skin graft except in two cases, and these were due to the patients concerned interfering with the artificial scab.

### Reviews

HANDBOOK OF OPHTHALMOLOGY.—By Everett L. Goar, A.B., M.D., F.A.C.S. 1948. The C. V. Mosby Company, St. Louis. Pp. 166 with 48 text-illustrations and 7 coloured plates.

This book has been written with the idea that there is too much matter in most textbooks designed for Junior Medical Students. The author has attempted to 'put down the essentials that a student or general physician may grasp'. The book does not really fulfil the intentions of the author and shows considerable lack of balance between essentials and rareties. For example, the extremely common and important condition of angular conjunctivitis only gets two lines and yet the rare Sjogren's Syndrome receives eighteen lines. Trachoma is not illustrated and yet membranous conjunctivitis is given a picture. Treatment is not sufficiently dealt with. Operations are mentioned so briefly and not illustrated at all, that it is very difficult to understand the text.

E. J. S

AIDS TO OPHTHALMOLOGY.—By P. McG. Moffatt, M.D. (Lond.), M.R.C.P., F.R.C.S. (Eng.), D.O.M.S. 1948. Tenth Edition. Baillière, Tindali and Cox, London. Pp. viii plus 266 with 118 illustrations. Price, 6s. 6d.

This book, the first edition of which was published in 1910, is one of the well known 'Students' Aid

Series'. Owing to the death of Mr. Bishop Harman it is now edited and has been brought up to date by Mr. P. McG. Moffatt. Like all the volumes of this series it is rather too condensed for the beginner and too sketchy for the more advanced student. It is, however, an excellent revision book for those with already some practical knowledge of ophthalmology.

E. J. S.

PRINCIPLES GOVERNING EYE OPERATING ROOM PROCEDURES.—By Emma I. Clovenger, R.N. 1948. The C. V. Mosby Company, St. Louis. Pp. 215. Illustrated.

The book is written by a Nursing Sister who has worked for many years in charge of the operating theatre of the New York Eye Infirmary. The title of the book is most misleading. Few principles are discussed. Miss Clevenger states dogmatically what technique is used in the theatre of the New York Eye Infirmary. The book consists largely of lists of instruments used by the various surgeons to the hospital for various operations. This eventually becomes ludicrous when we read a list of 34 instruments used by Dr. Berens for combined entaract extraction, followed by the details of the instruments used by no less than eleven other surgeons, each of whom is mentioned by name. When one reads under the sub-heading Ophthalmoscope.—'This is a very delicate instrument. The handle is fitted with two Ever Ready batteries' one gets an idea of the general standard displayed. The book will be of interest to any nurse who may have to work in the theatre of the New York Eye Infirmary.

E. J. S.

NUTRITIONAL DISEASES IN INDIA: DESCRIBED FOR STUDENTS AND PRACTITIONERS.—By R. Passmore, M.A., D.M. (Oxford), Captain, I.M.S. 1948. U. N. Dhur and Sons, Limited, Calcutta. Pp. vili plus 128. Illustrated. Price, Hs. 10

This book gives a practical account of nutritional diseases as they present themselves to practitioners in India. It is the result of the author's long experience acquired while on the staff of the Indian Research Fund Association Laboratories at Coonoor and on active service with the Indian Army during the war. In order to make the book really practical he has cut down the chemical and pathological aspects of the subject to a minimum and stressed on clinical, as opposed to laboratory diagnosis. He describes the signs and symptoms of malnutrition and deficiency diseases, so that these conditions can be clinically diagnosed. Accepted and practical methods of treatment are given. There are five useful appendices giving: (1) tables of food analysis, (2) summary of dietary requirements, (3) properties of important vitamins, (4) diet-scales in Indian military hospitals and (5) menu of a special invalid kitchen.

The book makes no pretence to be a complete monograph on the subject, but it has the merit of being comprehensive and fairly up to date. It should be useful to medical students and practitioners in India.

R. N. C.

MODERN TRENDS IN DERMATOLOGY.—Edited by R. M. B. MacKenna, M.A., M.D. (Camb.), F.R.C.P. (Lond.). 1948. Butterworth and Company (Publishers), Limited, London. Pp. xiv plus 432. Illustrated. Price, Rs. 36-12. (Available from Messrs. Butterworth and Company, Limited, Calcutta)

This is really a review of the study on dermatology in its various aspects by the workers in their respective spheres of research. The editor and the publishers deserve our thanks for getting together so many eminent authors.

The introduction by the editor is the best part of the book and is both interesting and instructive. The size of the book might well have been reduced as many chapters repeat facts old and established. Mr. C. P. Aggarwala, officiating Deputy Assistant Director-General (Medical Services), Medical Store Depot. Raipur, has been appointed to the temporary post of Assistant Drugs Controller, Madras, with effect from the 14th November, 1948 (forenoon).

#### · PROMOTIONS

The following officers of the late I.M.S. have been granted the honorary rank of Colonel with effect from dates shown against their names:—

Lieutenant-Colonel R. K. Misra. Dated 23rd September. 1947.

Lieutenant-Colonel A. Y. Dabbolkar. Dated 21st December, 1947.

Lieutenant-Colonel S. S. Bhatnagar. Dated 5th July, 1948.

Captain to be Major

A. M. McGavin. Dated 28th December, 1946.

#### RELINQUISHMENTS

The undermentioned officers are permitted to relinquish their commissions with effect from the dates shown against their names:—

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS (Emergency Commissions)

Captain D. Bhatt. Dated 29th May, 1946.

Captain B. K. Nandy. Dated 29th May, 1946.

The undermentioned officers are permitted to relinquish their emergency commissions in the I.M.S./I.A.M.C. on release from the Army Service with effect from the dates shown against each and are granted honorary ranks as shown in brackets:—

Major M. A. Iyer (Major). Dated 11th June, 1946. Captain C. S. Nath (Captain). Dated 6th May, 1946.

The undermentioned I.M.S./I.A.M.C. officers who have been released from the Army Service on the dates shown against their names are granted honorary ranks, as shown in the brackets against their names on release:—

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE SECONDED TO THE INDIAN ARMY MEDICAL CORPS (Emergency Commissions)

Captain Chiruvolu Suryanarayana (Captain). Dated 7th February, 1947.

Captain Om Parakash Markandya (Captain). Dated 31st July, 1947.

Major Jagat Durlay Bhattacharyya (Captain). Dated 29th March, 1947.

Captain Ved Parkash Malhotra (Captain). Dated 15th December, 1946.

Captain Jogendra Lal Basak (Captain). Dated 24th December, 1946.

Captain Santosh Kumar Mitra (Captain). Dated 15th December, 1946.

Captain Mundyath Janardhana Menon (Captain). Dated 29th November, 1946.

Captain Som Parkash Kalsy (Captain). Dated 21st January, 1947.

Major Krishnaswami Navalpakkam (Major). Dated 2nd October, 1946.

Captain Karra Umamaheswara Rao (Captain). Dated 21st October, 1947.

Major Ronald Sushil Chandra Bancrice (Major). Dated 21st September, 1947.

Lieutenant-Colonel Biswanath Barat (Lieutenant-Colonel). Dated 19th December, 1946.

Captain Dwijendra Nath Ganguly (Captain). Dated 7th April, 1947.

Captain Kasturi Lal Gupta (Captain). Dated 13th February. 1947.

Major Bishan Kishore (Major). Dated 5th May. 1947.

Major Madho Swarup Gupta (Major). Dated 28th August, 1947.

The undermentioned officers are permitted to relinquish their Emergency Commissions on release from the Army Service on the dates shown against them and are granted honorary ranks as shown in brackets against their names:—

INDIAN LAND FORCES—INDIAN MEDICAL SERVICE (Emergency Commissions)

Captain Meherji Phiroze Mehta (Major). Dated 4th August, 1948.

Captain Cuppam Mohan Rangam (Captain). Dated 10th February, 1948.

Captain Doulatabad Narayanarao Madhava Rao (Captain). Dated 12th July, 1948.

#### RETIREMENTS .

Lieutenant-Colonel R. K. Misra. Dated 23rd September, 1947.

Lieutenant-Colonel A. Y. Dabbolkar. Dated 21st December, 1947.

Lieutenant-Colonel S. S. Bhatnagar. Dated 5th July, 1948.

Lieutenant-Colonel M. A. Singh. Dated 22nd September, 1948.

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#### THE

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### For the year 1948

[Original Article 'O. A.'; Mirror of Hospital Practice 'M. H. P.'; Editorial 'E.'; Special Article 'S. A.'; Occasional Notes 'O. N.'; Medical News 'M. N.'; Public Health Section 'P. H. S.'; Current Topics 'C. T.'; Correspondence 'C.'; Therapeutic Notes 'T. N.'; Any Questions 'A. Q.'; Medicolegal 'M.'; Social Reform Section 'S. R. S.'; Italics signify Reviews; Reviews are placed under the name of the author; they also appear under the heading 'Reviews', where they are arranged according to subjects.]

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